STUDENT ACADEMIC UNDERPREPAREDNESS AT SOME TECHNIKONS IN SOUTH AFRICA

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I, the undersigned, hereby declare that the work contained in this dissertation is my original work and that I have not previously in its entirety or in part submitted it at any university for a degree

ABSTRACT

The study investigates the problem of student academic underpreparedness (SAU), which constitutes one of the hindrances to academic success at technikons, at five technikons in SA.

The research design and methodology outlined in Chapter 1 identify three subproblems as underpinning SAU. Subproblem one lists six SAU subtypes. The sixth subtype, in particular, was identified as a critical one in that it can perpetuate a regressionary etiology of a cycle of failure at school and technikon. Subproblem two postulates that technikon pre-entry selection criteria make implicit assumptions about student underpreparedness.

Chapter 2 reviews salient literature on second language (English) acquisition (SLA) and the acquisition of scientific concepts or higher order thinking skills. Chapter 3 reviews contemporary literature on SAU reversal of academic and vocational skill impairment. The argument is presented that recognition of prior learning (RPL) experience should be extended to an acknowledgement of students' indigenous knowledge systems (IKS).

Empirical data were gathered from five technikons, two from the Western Cape, two from the Eastern Cape and one from KwaZulu Natal. Quantitative and qualitative research survey methodologies were employed to gather and analyse data. Methods used were a questionnaire on student learning administered to students and interviews

with technikon staff. Chapter 5 discusses the data presented in Chapter 4 in relation to the problems and hypotheses postulated in Chapter 1, as well as to second language acquisition (SLA) and scientific or higher order thinking skills acquisition. Chapter 6 reports on the findings and makes recommendations for future research. Since it seems that proximal (intrinsic) underpreparedness has a substantial effect on SAU, a longitudinal study should be undertaken so that an academic underpreparedness indicator (AUI) can be designed. Concerted expert mediation of academic tasks and strategies should be provided since these play a critical role in developing students' capacity for successful performance at technikon level.

ABSTRAK

Hierdie studie ondersoek die probleem van akademiese ondervoorbereidheid van studente (afgekort AOS) vir studie aan 'n technikon soos dit in vyf technikons in Suid-Afrika aangetref word. Hierdie ondervoorbereidheid is een van die struikelblokke tot akademiese sukses.

In Hoofstuk 1 word die navorsingsontwerp en metodologie uiteengesit. Drie subprobleme wat onderliggend is aan AOS word geïdentifiseer. Subprobleem een bestaan op sy beurt uit ses AOS-subtipes. Die sesde subtipe word as van kritieke belang beskou omdat dit 'n regressiewe, sikliese patroon van mislukking op skool en aan die technikon verstewig. Die tweede subprobleem gaan van die veronderstelling uit dat die toelatingskriteria van 'n technikon implisiete aannames oor AOS maak.

Hoofstuk 2 verskaf 'n oorsig oor relevante literatuur oor tweedetaalverwerwing (Engels) en die verwerwing van wetenskaplike konsepte of hoërorde-denkvaardighede. In Hoofstuk 3 word 'n oorsig gegee van kontemporêre literatuur oor AOS en wyses waarop gebrekkige akademiese en beroepsgerigte vaardighede reggestel kan word. Daar word aangevoer dat die erkenning van vorige leerervarings uitgebrei behoort te word om ook die erkenning van studente se kultuureie kennissisteme in te sluit.

Empiriese data is by vyf technikons in Suid-Afrika ingesamel: twee in die Wes-Kaap, twee in die Oos-Kaap en een in KwaZulu Natal. Kwantitatiewe sowel as kwalitatiewe navorsingsmetodes is gebruik om die data in te samel en te analiseer. Studente aan die

technikons het vraelyste ingevul oor studenteleer en onderhoude is met personeellede gevoer. Hierdie data word in Hoofstuk 4 aangebied.

In Hoofstuk 5 word die data bespreek teen die agtergrond van die probleme en hipoteses soos in Hoofstuk 1 beskryf, asook teen die agtergrond van tweedetaalverwerwing en wetenskaplike of hoërorde-denkvaardighede soos uiteengesit in Hoofstuk 2.

Bevindinge en aanbevelings vir verdere navorsing word in Hoofstuk 6 aangebied. Aangesien dit lyk asof intrinsieke ondervoorbereidheid 'n substansiële uitwerking op AOS het, behoort 'n longitudinale studie onderneem te word met die doel om 'n indikator vir akademiese ondervoorbereidheid (IAO) te ontwerp. Goed georkestreerde en kundige mediasie van akademiese take en strategieë behoort voorsien te word aangesien hierdie faktore 'n deurslaggewende rol speel in die ontwikkeling van studente se vermoë om suksesvol op technikonvlak te presteer.

**ukuze zithuthuzelwe iintliziyo zabo,
Bebandakanyiwe ngothando, kusingise
Kuyo yonke iindyebo yokuqonda okuqinisekileyo,
kusingise ekwazini imfihlelo
kaThixo uYise, nekaKrestu, ekufihlwe
kuye bonke ubutyebi bobulumko nobokwazi
(KwabaseKolose, 2:2-3).**

**My purpose is that they may be encouraged
In heart and united in love, so that they may
have the full riches of complete understanding,
in order that they may know the mystery of God,
namely, Christ, in whom are hidden all the treasures
of wisdom and knowledge (Collosians, 2:2-3).**

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I wish to state expressly that any errors and oversights in this work are solely mine.

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ACRONYMS

AA – Academic ability
AD – Academic development
AE – Academic effort
API – Academic preparedness indicator
ASP – Academic support programme
AUI – Academic underpreparedness indicator
BT – Border Technikon
Btech – Baccalerium Technologiae
CALL – Computer assisted language learning
CALP – Cognitive academic language performance
CD – Curriculum development
CESM – Classification of educational subject matter
CT – Cape Technikon
CTP – Committee of technikon principals
DEC – Department of education and culture
DET – Department of education and training
DIT – Durban institute of technology
DoE – Department of education
DTET – Department of education and training
EAP – English for academic purposes
ECT – Eastern Cape Technikon
ESL – English second language

ESP – English for specific purposes
FB – Family background
FET – Further education and training
GI – General information
HAI – Historically advantaged institutions
HAS – Historically advantaged students
HBT – Historically black technikons
HBU – Historically black universities
HDI – Historically disadvantaged institutions
HDS – Historically disadvantaged students
HE – Higher education
HS – Home support
HSLE – High school learning experience
HSRC – Human sciences research council
HWI – Historically white institutions
IKS – Indigenous knowledge systems
KOT 1EZ – Communication skills course (Engineering)
L2 – Second language
LPAD – Learning performance assessment device
LC – Language communication
LD – Language development

LS – Language support
MLE – Mediated learning experience
Mtech – Magister Technologiae
ND – National diploma
NEPI – National education policy initiative
NQF – National qualifications framework
NT – Natal Technikon
Pen Tech – Peninsula technikon
PLE – Prior learning experience
PTEEP – Placement test in English for educational purporses
RPL – Recognition of prior learning
SAAAD – Southern African Association for Academic Development
SA – South Africa
SAQA – South African qualifications authority
SAU – Student academic underpreparedness
SAP – Student academic preparedness
SAFSERTEC – South African Certification council of technikon education
SI – Supplemental instruction
SLA – Second language acquisition
SLD – Second language development
TELP – Technikon education linkages programme
TLE – Technikon learning experience
TLS – Technikon learning support
TP – Technikon performance
TSA – Technikon South Africa
UCT – University of Cape Town
UG – Universal grammar
USAID – United States Agency for International Development
UWC – University of the Western Cape
VB – Vernacular bilingualism
ZAD – Zone of actual development
ZPD – Zone of proximal development

CHAPTER 1

KEY CONCEPTS AND DESIGN OF THE DISSERTATION

1.1 INTRODUCTION

This study focuses on "student academic underpreparedness" (SAU) by placing the problem in the context of its setting. It then provides the research problem and its subproblems. The latter is followed by a definition of key concepts like "SAU", "historically disadvantaged students" (HDS), "historically disadvantaged institutions" (HDIs), "historically advantaged students" (HAS), "historically advantaged institutions" (HAIs), "student academic preparedness" (SAP) that characterise the research study's problem. It also describes the various technikon SAU responses.

The design or methodological factors to be outlined include the descriptive survey, quantitative and qualitative means of triangulation, as well as the hypotheses, assumptions, dissertation structure and justification for the study (Leedy, 1993:145).

1.2 PROBLEM AND ITS SETTING

The problem was studied in relation to a number of rural and township undergraduate students with inadequate matriculation grades for successful completion of their technikon study programmes. Most of these students are products of poor and under-resourced public schools and community backgrounds. Various concepts have been used to describe them and "underpreparedness" is one

of the most salient of these concepts. This concept, therefore, forms the study's nexus.

The various meanings that are attributed to this concept universally and in South African (SA) higher education (HE), especially at the technikons, is of special significance to the study. It should be noted that SAU is a national HE challenge which the National Plan for HE (NPHE) considers a social redress policy priority (Ministry of Education, 2001:34).

Other important SAU factors concern the selection and admission criteria for "access" to technikon study (Ministry of Education, 1997 and 2001). These factors have a major bearing on the "underprepared" students' technikon entry and exit. The severity of "underpreparedness" of those students is sometimes undetected during their technikon entry, but it soon surfaces after their admission. It surfaces mostly at first year study level after, for instance, the students have gone through a "cycle of course failure" sometimes resulting in technikon withdrawal or drop-out.

The above situation, when students remain in the system but do not progress systematically, has been termed a "revolving door syndrome" (Ministry of Education, 1997 and 2001). Other factors behind that revolving door include faculty and/or institutional exclusion as a result of failure, fruitless interfaculty course changes and inter-technikon migration (Tinto, 1985; Bawa, 1993:19-23; Hawarden, 1993:10; Savage, 1993; Ministry of Education, 2001:32).

These complex SAU symptoms threaten to lower the technikons' selection/ admission criteria and academic "standards" (Shippey, 1994:147-172). They also

highlight an urgent need to balance the needs of academic and institutional "excellence" with those of technikon transformation and restructuring (Bawa, 1993; Ministry of Education 2001). The SAU challenge, therefore, occupies an important social, political and economic place in the changing landscape of SA post-apartheid HE.

The absence in SA of a centralised national HE statistical database[1], like the American one (Bowen & Bok, 1998), indicating the spread of the SAU phenomenon across the universities and technikons, is a major hindrance to research in the field. It imposed severe limitations on the study's "ability" to present preliminary SAU statistical indications that cut across the technikons. The next discussion considers the SAU universality.

1.2.1 Universality of SAU

The SAU problem is not peculiar to the SA schooling and HE system. Leibowitz, Goodman, Hannon and Parkerson (1997:6) contend, however, that apartheid and multilingualism give SAU its acutely SA dimension.

In America where most of the underpreparedness research has been done, this problem is acknowledged as dating back to the mid-1800s. That was a period when "college preparatory" programmes were initiated as institutional and organised SAU responses (Tinto, 1975 & 1985; Tomlinson, 1989; Ileki, 1995; Johnson, 1992; Hagborg, 1996; Golebiowski, 1997; Leibowitz, Goodman, Hannon & Parkerson, 1997). It affects not only the undergraduate students, but also the postgraduate ones

[1] See the NPHE concerning this point.

as well (Pitts, White & Harrison , 1999:1-2). Most of those students are drawn from the school leaving African American, Hispanic and Asian American student cohorts (Bowen & Bok, 1998:22). Even in Britain and Australia it has also been identified as a major challenge to the students' successful academic performance (Mohan, 2001).

Both the American and SA higher education systems have had experiences of the schooling and HE institutional segregation along predominantly white and black racial colour lines. Such social disparities have resulted in educational demarcation in terms of, on the one hand, sufficiently resourced public suburban schools and, on the other hand, under-resourced and marginal rural and township schools.

While contributing to the SAU research done at universities[2], the research study will also shed light on the deleterious effects of SAU especially on first year academic, vocational and career technikon student aspirations and achievements.

The problem is stated next.

1.3 STATEMENT OF THE PROBLEM

The macro SAU factors can be described as follows:

> The SAU concept carries high political connotations. The challenge is to define it with cognisance of such political dynamics, but isolate and emphasise its technikon educational features.

[2] See the University of Cape Town's (undated) "Report of the Review Committee on Undergraduate Education".

The literature consulted suggests a loose usage of this concept in American and SA higher education. This has resulted in the proliferation of various SAU terminology. That varied terminology is cited by Tomlinson (1989:7) who lists no fewer than ten different labels used between 1860 and 1989 (see figure 1.1 below), to characterise American "underprepared" students.

Time Span	Student Labels	Program Labels
1860s to 1890	Special students	College preparatory studies
1900s to 1940s	Underachievers	
	unprepared students	Remedial assistance
		Learning assistance
		How to study
1950s to present	Low ability	Developmental
	underachievers	Remedial
	Disadvantaged	Compensatory
	Underprepared	Special studies
	Deficient	Academic skills services
	High risk	Basic skills
	Nontraditional	College reading
		Academic rehabilitation
		College study skills
		Academic support
		Learning assistance

Figure 1.1: Labels used to describe underprepared students (Tomlinson, 1989:17)

Although the concepts that were in vogue from the 1860s to 1940s no longer have currency in the present times, those from the 1950s are, however, still used. Examples of such concepts are "underprepared", "underachievers", "disadvantaged" and "high risk" concepts. These have survived because of strong "civil rights" undercurrents that underlie them (Bowen & Bok, 1998).

Bowen & Bok (1998) also trace the use of such concepts to the domain of "educational equity". That domain has sometimes led, in the researcher's view, to an emphasis on "equity" and under-emphasis on SAU learning inhibiting factors.

It seems that the critical challenge is to balance the interests of "equity" with those of designing testing instruments for SAU prognosis. Whereas this is being done at some technikons, others have however only been able to focus on the SAU redress aspects.

Some studies[3] locate "underpreparedness" in the areas of language, writing skills, cognitive skills, "life skills" and computer enhanced learning. There is also a need to consider this problem from a broad "academic literacy" perspective and also from the students' "negotiating voice" (Leibowitz *et al.*, 1997:5; Boughey, 2000:282-283).

It can be argued that there is also a tendency to subsume SAU under the "academic preparedness" criteria. This happens especially during technikon selection and admissions testing (Louw & Smit, 1993). However, the purpose of these admission procedures is to socialise students into "academic preparedness" that is a hallmark of the HE academe (Hyland, 1996:251-260; 1997: 26-27; 1998:438).

Herrick (1993:239-247), Mveke (1993:19-27), Mabizela (1993:85) & Boughey (1993:124-136)[4] argue that it is necessary to incorporate student centred input into that enculturation process because such an input can convey their (the students')

[3] See Boughey ~~&and~~ Leibowitz (1993), Moyo, Donn & Hounsell (1997) and NEPI Report (1992:55),
[4] In listing the four "Broad Aims of An Admissions Process in the American HE system, Bowen & Bok (1998:23-25) identify the loyalty to an institution and its tradition/culture as a fourth key factor behind admissions policies.

subjective perceptions of the SAU and "preparedness" factors. That input solicitation is taking place at some universities where, for instance, the students are encouraged to keep personal journals for observational entries (Rule, 1993:275; Gough, 2000:54). Such entries are then used to reinforce the students' classroom and tutorial participation and writing skills development.

There are, undoubtedly, many other creative methods being used in HE to identify the "underprepared" students' perceptions of their "learning how to learn".[5] Rule (1993:275) sees two goals in such methods: (1) to give students writing space for monitoring their learning development and (2) to gain access to students' expressed problems, insights and difficulties. A purposive expression of perceptions such as the students' difficulties with lectures could probably even help the lecturers engage with the SAU features within classroom contexts (Cottrell, 2001:265). The macro problem has three subproblems that account for the SAU micro factors.

1.4 FIRST SUBPROBLEM

This subproblem contends that

> There is a need to distinguish SAU from its adjunct concepts such as "historically disadvantaged students" (HDS), "historically black students" (HBS); "historically black institutions" (HBIs) or "historically disadvantaged institutions" (HDIs) as these are often used loosely and contradictorily in SAU discourse. These concepts correlate conversely with those that describe the "historically advantaged students" (HAS) or "historically white students" (HWS) and "historically white institutions" (HWIs) or "historically advantaged institutions" (HAS).

These subproblems are considered in detail in the next discussion.

[5] The inverted commas are used in indicating the problematised concepts.

1.4.1 Academic "underpreparedness"

Students are considered "underprepared" in terms of particular perspectives that include: (1) their being first generation technikon students in their families or communities, (2) their lack of career guidance, (3) conflict between their "oral" community and written technikon discourse, (4) "good" matriculation results that prove inadequate at HE level, (5) instructional deficits or inadequate school teaching and also because of (6) a proneness to cyclical repetition of school grades that resurfaces as an obstacle to successful technikon learning. Other adjunctive "underpreparedness" perspectives relate to the notion of academic, historical and racial disadvantage that underpin the HE transformation for "redress" or "equity" attainment (Balintulo, 2002: 4 - 6).

Just as the "underpreparedness" term is placed within the particular social context, it is also necessary to locate it in a linguistic and cognitive domain. The study uses this concept to refer to a specific "impairment" (Feuerstein, Rand, Hoffman & Tannenbaum, 1980) of L2 English communicative and scientific or cognitive conceptual skills. This "impairment" is sometimes reflected acutely in "underprepared" first year technikon students' difficulty with transitioning from school to technikon (Haiden, 2002:1).

The six subtypes that are mentioned above are described in detail in the next discussion. That discussion is followed by a treatment of the adjunctive characteristics of this concept.

1.4.2 First generation students and underpreparedness

This SAU subtype occurs among students who are first in their families or even in their communities – especially in the rural areas – to attend a tertiary education institution. Such students mostly have no role models or persons to help them negotiate their transition to technikon education (Ministry of Education, 2001; Haiden 2002:1).

1.4.3 No career guidance and underpreparedness

As most rural and township public schools have no career guidance teachers to help the learners construct their future academic careers, this situation sometimes has the following results: students make wrong career choices, fail their tests/examinations and change frequently their technikon study courses before eventually dropping out. These problems have their root in the lack of school career guidance that is also a symptom of "teacher underpreparedness" in those public schools (NEPI, 1992b; Ministry of Education, 2001).

1.4.4 Good matric results and underpreparedness

Even when students have met the requirements for admission to tertiary study, most technikons and universities require the prospective students to pass the selection and placement tests. The students who fail these tests are sometimes classified as "underprepared" but given "second" study chances in terms of which they are admitted through redress, equity or alternative technikon selection routes (Ministry of

Education, 2001; Vetta, 1993). Thus, some students are considered underprepared regardless of "good" matriculation results.

1.4.5 Discourse conflict and underpreparedness

The vocational and technical technikon environment, on the other hand, uses primarily secondary, written technical discourse. Most of the rural and township "underprepared" students come from discourse cultures in which primary discourse is almost exclusively used. Pitts, White & Harrison, (1999:1) contend that the serious consequence of this disjuncture is that sometimes HE lecturers move a level down in their teaching or pass students who do not appear to know very much at all instead of addressing the students' discourse difficulty.

1.4.6 Instructional deficits and underpreparedness

"Underpreparedness" in other technikon students can be traced to the contrastive "mother tongue" (first language) and "target language" (second language) school instructional practices. That instruction is characterised by "spoon feeding" and "rote learning" by, respectively, the teachers and learners (Schonell, Roe & Meddleton [6], 1962:313-340; Haiden, 2001; Ministry of Education, 2001). Once admitted to the technikons, most of those learners struggle even to take down lecture notes and ask lecture follow-up questions.

The "deficit" notion as used here refers to the "poverty of the stimulus" (Schonnell *et al*, 1962: 313-320; Feuerstein et. al, 1980; De Villiers, 1999) in rural and township

[6] Although this is an old text, its discussion of student failure is important because it examines the subject from a cross disciplinary perspective

second language (L2) school instruction. This deficit is not prevalent only in rural and township schools, but it also extends, as it is also contended in Chapters 4 and 5, to some technikons where the lecturers use Xhosa or Zulu "mother tongue" to teach English communication.

1.4.7 Cycle of failure and underpreparedness

Other "underprepared" students complete grade 12 matriculation after numerous unsuccessful attempts. Some of them complete their school education at cram colleges or "finishing schools" that were established to cater for those learners' needs. In most cases those students get trapped in a "cycle of school failure" or the repeating of most school grade levels that remerges as an intrinsic barrier to their successful first year technikon academic performance (Schonnell, *et al.*, 1962: 4-6 & 313-330; Robinson & Kubala, 1996: 1-3; Cottrell, 2001:41). They also relapse regularly into their previous failure cycle and adopt a failure avoiding disposition leading them to change their faculties twice or even thrice in the hope of success before dropping out of their technikon. The adjunct SAU concepts are treated next.

1.5 ADJUNCT UNDERPREPAREDNESS CONCEPTS

The SAU concept is sometimes explained in "historical disadvantage or advantage" adjunctive terms. The next discussion considers these terms.

1.5.1 Historically disadvantaged students

The concept historically disadvantaged students (HDS) is sometimes equated with the term "black", i.e. African, Indian and "coloured" (mixed racial descent) students.

This is semantically incorrect because the black concept is race-orientated whereas the African one considers Africa, i.e. sense of place, as a locus of social identity construction (Nakasa, 1993:16-24). That consciousness makes it possible, for example, to talk of an Arab or white African. The Indian concept, on the other hand, also identifies India (place) as a launching pad for SA identity construction. These HDS meanings have a potential for distorting the SAU concept.[7]

The concept HDS was imported with its contradictory semantics from the American academic jargon (Tomlinson, 1989; Noel, Lavitz, Saluri & Associates , 1987). Its unfiltered adoption by SA higher education has led to the different and shifting SAU meanings. These semantic shifts abound even in the NPHE (2001). Nevertheless, the concept has also been described as depicting a "heritage of disadvantagement" (Ridge, 2000:xiii). These semantic contradictions, it can be inferred, stem from strong anti-apartheid historical currents underpinning the HE redress policy imperatives.

The HDS term is also a socio-economic referent for factors like family indigency, underesourced public schools, home–school commuting and overcrowded homes and settlements (Ministry of Education, 2001; Pandor, 1997:1). There is a need to standardise the use of these terms, especially in addressing the policy options that cater for teaching and learning needs of "underprepared" students.

[7] In America another concept, "minority students", is commonly used to include concepts like HDS and HDIs.

1.5.2 Historically disadvantaged institutions

The concept "historically disadvantaged institutions" (HDIs) or "historically black institutions" (HBIs) is used in reference to technikons such as Mangosuthu, Border, Eastern Cape, the then ML Sultan, Northern Gauteng, Peninsula technikon (NEPI, 1992:72). This race centred concept is often used ambiguously because some of these institutions assume their identities from ethnic and language norms. Institutions like Mangosuthu, Border, Eastern Cape and Peninsula Technikons were created respectively for the Zulu, Xhosa and coloured ethnic and language communities.

Even if the majority of students at these technikons are black (African) and "underprepared" academically (Pandor, 1997:1), a close look at their student demography could show that the majority of those students are Zulu, Xhosa and Afrikaans mother tongue speakers. Unless such institutions expunge these ethnic identities, they have to be considered ambiguously in black and ethnic terms.[8]

The case of multiethnic institutions like the Cape, Pretoria and Port Elizabeth Technikons differs slightly. As a result of the current national HE transformation, these institutions are in the process of moving from their mono-racial and ethnocentric, Afrikaner or English, demographics to become multiethnic and multicultural campuses. Technikons like the Cape, Pretoria, are still termed "historically white institutions" (HWIs) in that they were meant to serve the "historically advantaged students" (HAS) (Moja, 1993). This concept will be discussed next.

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[8] Even the National HE Plan (2001) acknowledges the "homeland" or "Bantustan" origins of these institutions.

1.5.3 Historically advantaged students

The concept historically advantaged students (HAS) is assumed to carry an implicit and misleading connotation that white students have a natural potential for academic excellence and success (Moja, 1993:3). It is also used in reference to white social and middle class students' backgrounds (Louw & Smit, 1993:382).

Thus, this concept describes the cultural, economic and academic advantages in terms of which other students are seen as disadvantaged or "underprepared" . It is also used racially in reference to "historically white students" (HWS).

The term, "historically advantaged institutions" (HAIs), is considered next.

1.5.4 Historically advantaged institutions

The concept historically advantaged institutions (HAIs) is a socio-economic concept. It is often used in describing integrating campuses like the Cape, Pretoria, Port Elizabeth and Free State Technikons. These were predominantly white and monolingual English or Afrikaans medium institutions[9]. Most of them are changing to become English/Afrikaans bilingual institutions. The exception is the Durban Institute of Technology (DIT) that is an amalgamation of the former Technikon Natal (HWI) and Technikon ML Sultan (HDI).

The move from historical monoculturalism to multicultural student demographics overturns the traditional HAI meaning. If a substantial proportion of students who

[9] The NEPI post secondary education report uses the term "white liberal universities" to refer to the large metropolitan universities of Cape Town, Natal and Witwatersrand (1992:73).

attend these institutions come from historically disadvantaged backgrounds, then this can be taken as evidence of cultural transformation and redefinition of institutional ethos. The terms rural and township that are used in this study, as well as in the SAU literature, are considered below.

1.5.5 Rural and township terms

Both these concepts have socio economic meanings. The township concept refers to both political and cultural marginality that contrasts sharply with the SA suburban situation. The term rural also has an implicit connotation of marginality in that the rural areas are far removed from urban centres of economic life. Unlike the township technikons such as Mangosuthu in Umlazi in Durban, the rural technikons like the Eastern Cape Technikon, Technikon Northern Gauteng, and Border Technikon are located far from the industrial centres. This is a severe vocational and career disadvantage for their students who have to do industry "in service" training as part of their course requirements.

The second subproblem is treated in the next section.

1.6 SECOND SUBPROBLEM

The second subproblem is that:

> The technikon selection and admissions procedures are based on implicit assumptions of "student academic underpreparedness" and "preparedness".

Bowen & Bok (1998:23-24) list four critical factors that define the broad aims of a HE institution's selection and admissions programme: (1) the promise of excellence in a chosen area of study, (2) assembling a class with a diversity of backgrounds and talents, (3) attracting students who will make a contribution to their professions and society's welfare and (4) inculcating respect for institutional loyalties and traditions. Most "underprepared" technikon students fall short of these requirements (Louw and Smit, 1993: 382).

The above criteria have influence on the design of the HE selection and admission instruments such as the Standard Aptitude Test (SAT) battery (Louw and Smit, 1993:382-389) and placement assessments. Because of their inherent connotations of "academic preparedness", the next section will discuss each of these in detail.

1.6.1 The promise of excellence

The promise of excellence establishes a semi-contractual relationship between a technikon that has granted admission and a student (Bowen & Bok, 1998; Louw & Smit, 1993:383). On the part of the institution, the promise means that a technikon that has granted admission undertakes to provide excellent teaching and learning facilities for a student's achievement of his/her learning goals. From the part of the student, the promise is an undertaking to work diligently in achieving excellent academic results.

Schonell *et al.* (1962:4-12) argue that a great deal happens between the conclusion of a promise of excellence and its attainment at graduation. It is necessary,

therefore, that even an equity admission should be based on this promise of excellence, even if it may take longer for an "underprepared" student to fulfil it.

The use of "equity" in HE access is important as a means of avoiding "unfair discrimination" which is outlawed by The Constitution of 1996 (Act No. 108 of 1996) (Hawarden, 1993:10; Louw & Smit, 1993:381-2; Venter, 1993:393-4; Winberg, 1993a: 371). Another requirement is that admission procedures ensure diversity of backgrounds and talents. The next section explores some of the implications of this viewpoint.

1.6.2 Diversity of backgrounds and talents

The diversity principle facilitates a flexible academic selection and channelling of "underprepared" students (Louw & Smit, 1993:382). The students may be deselected if only the "utility" or merit principle is applied. Thus, both the diversity and utility principles have to be weighed, one against the other, in determining a student's potential for excellent academic performance (Louw & Smit, 1993:382; Bowen & Bok, 1998:24).

Admission of an "underprepared" student through diversity implies an undertaking by him/her to prove his/her excellence regardless of the condition of "underpreparedness". Similarly, a technikon of admission commits itself to assisting that student, even through special measures like extending the diploma/degree

duration beyond the normal 3 years to realise his/her academic excellence (Louw & Smit, 1993:390).[10]

Thus, the promise of excellence is unrealisable unless both the "underprepared" student and the institution of admission recognise the "special" nature of their relationship. That special status is conferred on the relationship by social equity considerations. Such redress admissions practices "discriminate fairly" in favour of "underprepared" students.[11] Even the notion of "academic talent" needs to be differentiated explicitly from, for instance, that of "academic giftedness" or "expert like" performance (Ericsson and Charness, 1994: 725-727).

The requirement for the students to contribute to their professions and to society is examined next.

1.6.3 Contribution to professions and society

This criterion requires the applicant to demonstrate a level of commitment to his/her course of study. Such a commitment should result in a scientific contribution to their profession and social welfare. The implication of this criterion is that "underprepared" students, regardless of their underpreparedness will, on completion of their studies, be able to have a level of expertise on the par with their professional peers and also be able to make a contribution within their rural and township communities.

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[10] These are programmes which, instead of a normal 3 years of study for a diploma, add one bridging year so that a diploma takes 4 years to complete.

[11] Affirmative/redress admissions have given rise to accusations of "unfair discrimination" in America (Bowen & Bok, 1998:8) and, if not checked properly or based on sound scientific basis, such legal loopholes are likely to lead to litigation, even in SA.

Some of these students, especially the rural ones who are removed from the industrial centres, sometimes need a rigorous induction into the industrial environment and preparation for welfare contribution. An example here is the closure of industries in Butterworths, Transkei, which severely affected the Eastern Cape Technikon and the Border Technikon's cooperative education and student job placement programmes [see Focus group interview in Appendix E]. Nevertheless most technikons have career guidance programmes in their student counselling units. In the next section, the requirement of "loyalty to institutional traditions" is examined.

1.6.4 Loyalty to institutional traditions

This criteria requires a student who has gained admission to honour the name, traditions and values of his/her chosen institution. This is not possible unless, in the case of "underprepared" students, the meanings of "loyalty" and "tradition" are explained explicitly and clearly. Examples of such loyalty can even be demonstrated through the use of alumni from the rural and township communities who are "vocational" and community success stories. Because of communal or collective social values, most rural and township students attend the alma mater of their parents.

After two decades of equity admissions, the American HE institutions have moved to what is now termed a "race neutral" admissions policy (Bowen & Bok, 1998: 15-17). It is necessary that the good intentions of a racial redress admissions programme do not, in the long run, undermine the long established academic traditions of an

institution. This is why, perhaps, the Ministry of Education (2001:56) emphasises that the achievement of equity will not be at the expense of white students.

The next subproblem identifies some of the programmes that are used in redressing "underpreparedness".

1.7 THIRD SUBPROBLEM

The third subproblem

> describes the various technikon programmes and projects that respond institutionally to the SAU phenomenon.

Most of the contact technikons in the study's sample have responded by setting up institutional programmes that address SAU. The only distance education technikon in the country, the Technikon SA (TSA), was excluded from the investigation because its non-contact pedagogy places it in a different category . It is necessary to examine in detail the specific types of support/development programmes that arose in response to SAU prevalence.

1.7.1 Academic support/development programmes

The historically white universities in SA took the lead in the 1980s in introducing SAU remediation programmes. The admission of black (African) students, with its attendant underpreparedness challenges as reflected in, for example, the "deficits" in English and mathematics was the main precipitator of such responses (Human Sciences Research Council, 1990; NEPI, 1992: 30; NEPI, 1992:55; Moya, 1993;

Moyo, 1997, Ministry of Education, 2001). Such responses generally took the form of academic support programmes (ASPs). It is accepted that these programmes began in the early '80's (Agar, 1990; Ferreira, 1995)[12].

Hunter (Human Sciences Research Council, 1990:24), the then director of ASP at the University of the Witwatersrand, defines such remediation programmes as follows:

> The label academic support is usually applied to structured teaching arrangements which are supplementary to the mainstream provision of lectures, tutorials and practicals, or which constitute enriched forms of mainstream courses'.[13]

The supplementary status of the ASP led to criticism that it was marginal and surface tinkering rather than penetrating to the core of SAU structures (Scott, 1987). Thus, Academic Development (AD) programmes replaced ASPs at universities and technikons in line with HE transformation. New programmes focusing on mainstream curriculum adjustment, such as the "extended curriculum", "foundation courses", "Integrated First Year Experience" and others have been instituted at the technikons.

The name change also signaled an intention by AD practitioners to locate or "mainstream" AD into the university faculty curricula. That mainstreaming came to be known as "curriculum development" (CD) (Annecke, 1993:135; Blunt, 1993:96-106; Drewett, 1993:50-3). This was borne of the realisation that ASPs had failed to address the "underprepared" students' curriculum needs (Scott, 1990; Annecke,

[12] The HBUs like UWC and others, initiated AD programmes mainly for staff development (Moja, 1993).

[13] Also see papers presented at ASP conferences by Vilakazi & Tema (1982) and Scott (1987), then UCT's director of ASP (now Centre for HE Development), and a UCT's "Report of the Academic Review Committee on Undergraduate Education," (1990).

1993:136). That AD mainstreaming is exemplified strongly by the University of the Western Cape's (UWC's) "infusion AD model" which aimed at academic excellence, democratic values and faculty ownership of AD (Leibowitz *et al*, 1997:5).

Other development programmes include the Writing Centres or Writing Laboratories, the science orientation and foundation programmes, English for academic purposes (EAP), English for specific purposes (ESP), Access programmes, supplemental instruction (SI), and computer assisted language learning (CALL).

The above programmes coexist with other traditional support (non-academic) programmes like Student Counseling Services, Student Affairs and Student Welfare which are all aimed at creating viable conditions for student adjustment and retention in the climate of competitive HE student recruitment (Moore & Carpenter, 1985; Valverde, 1985 & Noel, Lavitz, Saluri & Associates, 1985)[14].

As diversified institutions, the technikons introduced in the '90s a variety of the above programmes as their responses to SAU. Being career and technologically oriented institutions, their responses tend to integrate the language and cognitive development skills into AD programmes. Such programmes constitute a fit of technikon vocationalism (Kok, Strydom, Tromp & Engelbrecht, 1996:16).

A brief description of the "student academic preparedness" concept is necessary because this concept represents a "standard" of excellent academic and vocational performance to be achieved by technikon students.

.[14] See the South African Association for Academic Development's (SAAAD's) AD survey at HE contained in its report (Moyo, *et al*, 1997).

1.8 ACADEMIC PREPAREDNESS

Most of the literature on "student academic preparedness" (SAP) discusses this concept indirectly by phrasing it as, for example, "academic ability", "academic achievement", "academic success", etc. (Lavin, 1965:18-31; Schonnell *et al*, 1962:313-340; Gamaroff, 1999: 168-169; Van Eeden, De Beer, Coetzee, 2001: 171-174). This concept is used mostly with reference to those first year students who, after adjusting successfully to their technikon/university environments, are able to self-direct their learning and achieve good course grades.

The "ability" concept benchmarks the SAP variable. Sternberg (1986:379) argues, however, for considering both the learning (students') and teaching (lecturers') "abilities" in defining SAP. "Ability", in SAP, is a two-way concept that requires both the learning and teaching agents to be prepared for their respective tasks. This is necessary at both the school and the technikon level.

The SAP concept should, however, be distinguished from others such as "expert performers", "talented learners", "gifted learners", "high flyers" that denote the students who belong in the top levels of classroom academic performance (Conant, 1958; Stalnaker, 1958; Gallagher, 1979). These concepts are sometimes linked to a skill theory derived "academic competency" which is considered an indicator of technikon vocational preparedness (Engelbrecht, 1992).

1.8.1 Academic competency

The competency viewpoint of SAP distinguishes between capacity and a skill by contending that a skill is content full, and capacity is content free (Carey and Bruner, 1974:184). The possession of academic skills prepares the way for students' career and vocational readiness (Parziale and Fischer, 1998:100). The application of skill theory in defining academic competency is also discussed in chapter 3, section 3.1.2. In the next section, the hypotheses are provided.

1.9 HYPOTHESES

Two hypotheses will guide the empirical research.

1.9.1 First hypothesis

The first hypothesis is that

> the impaired second language (L2) English and scientific or cognitive conceptual skills account for a large proportion of SAU impairment.

1.9.2 Second hypothesis

The second hypothesis is that

> the SA technikons selected for this study have formulated various SAU responses. Each of these responses reflect the particular technikon's concern with the challenges SAU seems to represent to vocational curricula.

1.10 ASSUMPTIONS

Two assumptions underpin the theoretical and empirical thrust of the study.

1.10.1 First assumption

The first assumption is that SAU impairs not only the academic potential of students, but also their life skills, self-concept, vocational and career preparedness.

1.10.2 Second assumption

The second assumption considers the role of academic development (AD) and ASP as "learning mediators" that enable "underprepared" students to acquire the necessary technical L2 English and scientific conceptual skills for successful technikon study.

1.11 RESEARCH DESIGN

The research design is largely empirical with and interpretive element. Both the quantitative and qualitative techniques are used. Whereas the former entails measurement of data that are quantitative in nature, the latter uses the generic insider social action or field research to examine SAU from an empirical viewpoint (Babbie & Mouton, 2001: 49-54). The descriptive survey method (Leedy, 1993:185-219; Babbie and Mouton, 2001:229-264) was used in guiding the design of closed and open ended items in the "questionnaire on student learning", it was also used in designing the semi-structured technikon AD staff interview sheet for the focus group and depth individual interviews (Babbie & Mouton, 2001:233-237). Five technikons,

Cape Technikon, Border Technikon, Eastern Cape Technikon, former Natal Technikon and Peninsula Technikon, constituted the study's sample frame. The questionnaire was pilot tested at the Cape Technikon.

1.12 RATIONALE FOR THE STUDY

The necessity for the study is based on

- the decision by the HE technikon subsector and DoE policy to prioritise the redress of SAU
- the need to find ways of accelerating ways of empowering the students in question with the skills for academic and vocational success and excellence

The Ministry of Education (2001:32) reports that 20% of undergraduate and postgraduate students drop out of the HE system each year.

1.13 DELIMITATION

The study will not examine underpreparedness in relation to physically challenged and/or dyslexic students because of a lack of the necessary special education skills on the researcher's part. Nor does the study set out to justify or condemn any particular worldview or interpretation of historical or institutionally determined variants of the SAU and SAP concepts. The aim is to profile the programme responses to SAU without evaluating the success or failure of such responses. Although the research proposal had stated that the intended outcome of the study was to design an "academic underpreparedness indicator", that intention was aborted because it requires a systematic and rigorous respondent profiling and testing which the time limit of the study could not allow.

1.14 DISSERTATION STRUCTURE

The dissertation has six chapters.

Chapter 2 reviews the literature on second language and scientific concept acquisition. It distinguishes between what it terms “canonical” or “classical” literature which is a literature that dates from before the middle of the 1980s and “contemporary” literature that begins from the middle of the ‘80s to the present era. Some of that literature, such as that written by Feuerstein, fits in both categories. Chapter 3 reviews the literature on the reversal of various kinds of linguistic and cognitive "impairment".

Chapter 4 discusses the research design and ways in which the various types of data were gathered. Chapter 5 analyses the findings of the research in relation to the research problems and hypotheses, as well as insights gained from the literature review on second language acquisition and the development of thinking skills. Chapter 6 reports the research findings, limitations of the study and recommends some directions for future research.

1.15 SUMMARY

The Chapter defined key concepts relating to underpreparedness, disadvantage, advantage and preparedness baseline concepts contained in the study’s research problem, subproblems and questions. "Underpreparedness" was decribed as having universal and local SA contexts. The American HE setting, with its legacy of racially segregated education, was identified as sharing some of those chracteristics with the

SA HE sector. It was also argued that because of the civil rights currency that infuses concepts such as "underpreparedness", "disadvantage" and "high risk", they have been used contradictorily since the 19th century. This has happened mainly in America as well as in SA. Those contradictions abound even in national policy documents such the NPHE. The contradictions have also resulted in a proliferation of no less that ten or more labels that describe students with impaired learning "capacities" and/or "abilities". "Underpreparedness" is one of them.

Of the seven SAU subtypes that were identified, the "promise of academic and institutional excellence" was identified as the technikons' preferred marketing tag. However, such a tag needs to be used cautiously because some of the technikons are "HDIs" and, in fact, under-resourced institutions.

The design aspects entailed a description of hypotheses, assumptions and the quantitative and qualitative research methodology that was used in empirical data gathering and analysis. It also described the qualitative research techniques that were used in semi-structured staff interview data collection and analysis. Five technikons, two in the Eastern Cape, two in the Western Cape and one in KwaZulu Natal were selected for sample composition. The indeterminate use of terminology forms the basis for the justification of the study's rationale. The delimitation and description of the dissertation structure were also presented.

CHAPTER 2

SECOND LANGUAGE AND SCIENTIFIC CONCEPT ACQUISITION

2.1 INTRODUCTION

This chapter reviews "canonical" literature on student academic "underpreparedness" (SAU). It describes SAU briefly from a comparative perspective before focusing on technikon academic functions. Thereafter, the theories of second language and scientific concept, particularly relating to cognitive skills acquisition, are considered.

The term "canonical" is used here to denote the literature prior to the 1980s up to the early 90s. Post 90s literature is termed "contemporary". It is used sparingly in this chapter. Some of the literature, such as Feuerstein's, which is pivotal to the study's themes transcends this categorisation. It has already been used in the previous chapter and it will be used in this one as well as in subsequent ones.

Although there is ample Afrikaans literature on the technikons, only one English text could be found. That is Pittendrich's (1988) *Technikons in South Africa*. Although this text is slightly dated if it is evaluated in terms of current technikon transformations, it is, however, still the only available comprehensive text in English on technikon education. It not only illuminates the academic history of those institutions, but it also links technikon education to the manufacturing industry's vocational and career goals.

Some reports and planning documents, such as the NEPI reports (1992a, 1992b, 1992c, and 1993), the White Paper on Higher Education (1997) and the National Plan for Higher Education (NPHE) (2001), are used to fill the gaps in Pittendrich's text. The review commences with an examination of SLA canonical sources.

Attention is given to five SLA works. Larsen-Freeman (1991) *An introduction to second language acquisition and research* introduces some fundamental second language acquisition concepts. Ritchie and Bhatia (1996) provide some critical SLA questions. Four of Ellis's SLA texts are also reviewed: (1984), (1986), (1994) and also (1997). Each of them provide useful theoretical and analytical frameworks for understanding the SAU linguistic underpinnings.

Cummins's (1986) *Bilingualism in education* presents a comparative L1 and L2 acquisition perspective. This perspective offers theoretical insights into the challenges that sometimes face "underprepared" students whose mother tongue is neither English nor Afrikaans, especially during their first year at a technikon.

The scientific concept or cognitive literature review will consider Rieber, Carton and Aaron (1987) *The collected works of L.S. Vygotsky. Volume 1. Problems of general psychology*. This compendium distinguishes between Vygotsky's domains of "everyday" or "spontaneous" and "scientific" concepts that are markers of cognitive development.

That review will be supplemented by Davydov and Radzikhovskii's "conceptual apparatus" interpretation of Vygotsky's work, and Forman and Cazden's "cognitive

value of peer interaction". Both these sources are part of Wertsch's (1985) essay collection.

This literature proved useful for understanding the effects of an informal home or community acquired everyday concepts on the students' acquisition and understanding of the scientific concept. Other scientific concept acquisition theories that will be considered are Feurstein's "cognitive modifiability", "mediated learning experience" (MLE) and "instrumental enrichment" (IE).

Feuerstein's (1980) *Instrumental enrichment: an intervention program for cognitive modifiability* and his (1991) *Mediated learning experience (MLE): Theoretical, psychosocial and learning implications* will be used in distinguishing between the "distal" (extrinsic) and "proximal" (intrinsic) cognitive impairment factors. Another Feuerstein source, *Instrumental enrichment, an intervention program for structural cognitive modifiability: Theory and practice*, (In Segal, 1985:22-43) will be used as a supplementary text .

The discussion culminates in the presentation, in the form of a model, of "distal" and "proximal" underpreparedness variables. In the next section, the origin and functions of technikon education are explored.

2.2 TECHNIKON EDUCATION

The technikon vocational education system has a shorter history than that of universities. Its origin is linked to the discovery of diamonds in Kimberley in 1867 and the development of gold mining at the Witwatersrand in 1886. Such mineral

discoveries created a demand for technical education (Pittendrich, 1988:108). That demand was also a response to an emerging railway system's need for technical training of its illiterate workforce (Pittendrich, 1988:108).

Technical education arose, however, neither from the mining enterprises nor from the railway industry, but from rudimentary philanthropic evening classes for the working lads. Such classes comprised a vocational and arithmetic curriculum. That philanthropic pioneering marked the beginnings of modern technikon education (Pittendrich, 1988:108).

Technikon education is characterised by its vocational and career oriented qualification offerings (Kok, Strydom, Tromp & Engelbrecht, 1996:16). These qualifications include the National Diploma (ND), Baccalareus Technologiae (BTech), Magister Technologiae (MTech) and Laureatus Technologiae or Doctor of Technology (DTech) degrees. They differ from those of the Further education and training's (FETs) national technical (NT) offerings (Pittendrich, 1988:106) in that the former are meant for technical engineers and the latter are for artisans and technical assistants.

The entry requirements for these study programmes have been changed recently to comply with the National Qualifications Framework (NQF) course entry and exit requirements. Those requirements emphasise the widening of technikon access, recognition of prior learning (RPL), flexibility of entry, progression of learners and portability of qualifications (Du Pre & Pretorius, 2001: http://www.technikons.co.za/Index2.html).

Technikon curricula emphasise the students' acquisition of technological and career knowledge. This forms the cornerstone of this type of education (Kok *et al.* 1996:16). That utilitarian emphasis has profound implications for the "underprepared" students' potential compliance with the technikon medium of instruction and cognitive course requirements. The situation of a non-contact technikon, like Technikon South Africa (TSA), falls beyond the scope of the study.

Technikon and FET first year student intake consists, mostly, of those with "standard" scholastic grades (Frost, 1998:48). Although such entry requirements also attract students with matriculation exemption or "endorsement", the universities absorb most of the latter. Clearly, such standard grade entry-level requirements attract a substantial pool of "underprepared" students. Most of them are from former departments of education and training (DET) and department of education and culture (DEC) under-resourced public schools (NEPI, 1992c).

It is universally accepted that students with low scholastic exit scores also tend to have a history of poor school academic performance that is marked by proneness to "cyclical failure" (Friedlander, 1980; NEPI, 1992c 1992:26 & 51-52; NEPI, 1993:10 & 34; National Plan for HE, 2001). The seriousness with which such poor scholastic performances are viewed by the technikons has resulted in the HE alternative policy options of "access" and "redress" being reinforced through academic support programmes (ASP) and/or academic development (AD) programmes (NEPI, 1992c: 26 and Ministry of Education, 2001).

Friedlander (1980:23-24) summarises the characteristics of poor scholastic achievers in the following terms:

> [H]igh-risk students are more likely than their more academically successful peers to have experienced failure repeatedly in school situations, to have had difficulty in performing traditional educational tasks, to have received insufficient positive feedback or encouragement from their teachers or classmates on their efforts to overcome their deficiencies, and to have been in the bottom third of their graduating class.

Technikon open access and the quality of its educational programmes are special measures used in accommodating the "high risk" or "underprepared" students' learning needs. This has been done through, for instance, a deliberate lowering of course entry requirements that are also linked to alternative or redress instructional support for "underprepared" students (Shippey, 1994: 10; Ministry of Education, 2001:38).

It is also useful to consider the "high risk" student challenges in the context of technikon curriculum structuring. Both Pittendrich (1988:237) and Kok *et al.,* (1996:16) explain that technikon curricula are arranged in terms of the Classification of Educational Subject Matter (CESM). The CESM led to the industrially oriented national diploma curriculum being termed a "sandwich national diploma curriculum" (Pittendrich, 1988:240). It is still applicable, albeit in the context of an introduction of degree qualifications and the 1990s changes in the industry skills requirements under the South African Qualifications Authority (SAQA) Act. However, most technikons have their qualifications registered with SAQA and accredited via the higher education quality council (HEQC) (http://www.che.org.za)

The White Paper on HE (1997) and the NPHE (2001) both recognise the career oriented nature of technikon education. In fact these policy documents place the technikons at par with universities. Thus, some technikons, such as the Durban Institute of Technology (DIT), are, like the Massachussets Institute of Technology,

already positioning themselves as leaders in technological education. The strength of technikon education lies in its close links with industry (http://www.technikons.co.za/index2.html). This interface with industry, according to the Committee of Technikon Principals (CTP), has enabled them to structure courses with practical applications and to deliver graduates with knowledge that is immediately relevant in the workplace (http://www.technikons.co.za/index2.html).

The CTP and the South African Certification Council on Technikon Education (SAFCERTEC), are important technikon statutory education bodies which oversee policy concerning, especially, the admission standards and approval of certificates of any person who has complied with the minimum study requirements (Pittendrich, 1988:241-242).[1] These bodies and policy instruments assist, therefore, with the provision of credible technikon education..

One of the key criteria for such admission requirements is the language factor. It is often in the L2 English entry requirement, during testing for selection purposes that "underprepared" students fail to meet the technikon admission criteria (Louw & Smit, 1993). Such failure is often rooted, it appears, in the students' severely impaired potentials for L2 English performance.

2.3 SECOND LANGUAGE ACQUISITION THEORIES

Of the seven SLA theoretical tenets that are mentioned by Ellis (1986:250-267), only three of them, i.e., acculturation, variable competence and the discourse models are considered to have immediate applicability to the situation of rural and township L2 English of "underprepared" students. These theories are explored in the various

[15] Some of this legislation has been amended as a result of current HE transformation.

parts of the ensuing discussion. In the next section attention is given to the second language acquisition (SLA) concept is outlined.

2.3.1 SLA concept

Larsen-Freeman (1996:6) defines SLA as follows:

> A second language is one being acquired in an environment in which the language is spoken natively. For example, a Spaniard acquiring English in England would be acquiring it as a foreign language. In which environment the acquisition takes place is often related to the first variable, whether it takes place in a classroom or not, since foreign languages usually require instruction whereas second languages can often be picked up from the environment.

The SLA linguistic environment is important to the rural and township students who are distanced from a native-like English milieu. That distance often takes a geographic and psycholinguistic form. While most of the native like English speakers are located in the inner city or suburban public schooling environments, most of the "underprepared" students are in the peri-urban (township) and rural public schools where they hear so little English that it can be regarded as a foreign language.

Such environmental distances seem to necessitate the invocation of an “imagined” native like spoken L2 proficiency in the township and rural schools. Sometimes that imagined proficiency is reinforced through radio and television L2 English native-like school programmes. Most of these learners have little or no daily contact with native English speakers.

Since post 1994 there has been an increase in the enrolment of township learners in English native-like public medium schools. Such enrolments are motivated by two

key factors: first, the learners' desire to narrow the distance to a native-like L2 English environment and, secondly, "avoidance" of under-resourced public schools. Sometimes the parents' wish for their children to speak "perfect" English is an additional incentive for such native like suburban school attendances. This view of English expresses the parents' desire to overcome the hurdles of Bantu education as well as the learners' higher social class aspirations (Maake, 1991:61; Ndebele, 1987: 217 - 226).

Besides the environmental factors, it is also the type and quality of the linguistic "input" that plays an important role in determining the nature of the L2 output.

2.3.2 Linguistic input and acquisition capacity

Ritchie & Bhatia (1996:19) raise central SLA questions that underpin the L2 acquisition process. Three of them that are directly relevant to this study are listed below:

> (7) What cognitive structures and abilities underlie the L2 learner's use of his or her L2?
> (8) What properties of the *linguistic input* to the L2 learner are relevant to acquisition?
> (9) What is the nature of the L2 learner's capacity for attaining the cognitive structures and abilities referred to in (7)? Here we may distinguish the following two subquestions:
>
> a. What is the nature of the L2 learner's *overall capacity* for language acquisition?
> b. How is that capacity deployed in real time to determine the course of SLA?

Each of these questions reflect the significance of linguistic acquisition "capacity" and "ability" as ways of developing cognitive linguistic proficiency. However, that

proficiency in the rural and township students is sometimes affected by the properties of the linguistic input mentioned in (8) that are often inadequate for the full development of an L2 learner's (9)a overall capacity and its (9)b real time deployment.

Although the relation of L2 acquisition to cognitive structure is discussed in detail in Chapter 3, it can be mentioned here that the "cognitive linguistic impairment" aspects in question (7) explain most of an "underprepared" learner's difficulty in acquiring the L2. Cummins's (2000: 55) notion of "cognitive academic language proficiency" (CALP), which is also discussed in detail in point 3.2.4 of Chapter 3, provides useful insights in this regard.

One of the important challenges is to motivate the "underprepared" students not to be afraid of asserting themselves and competing with native English speakers, for example, in classroom participation, in multilingual and mutlicultural technikon classroom environments

Most "underprepared" learners are generally passive, withdrawn and unassertive in classroom situations (NEPI, 1992c; Miller and Bradbury, 1998:103-104; Haiden, 2001). This is attributable to their school inherited "fear of making mistakes" and also to their "inability" to employ cognitive deployment strategies. Such fears and withdrawals aggravate the students' underpreparedness condition.

The key processes in L2 acquisition include interlanguage variables, L2 competency and its impairment in the "underprepared" students' L2 taxonomy are briefly considered next.

2.3.3 Acquisition process

It is apparent from the literature that a student's first language plays a crucial role in defining an SLA process. However, this role has sometimes been referred to negatively as "first language interference" (Krashen, 1981:64). The role of the first language has also been described as sometimes leading to "padding" or the falling back on old knowledge when new knowledge is lacking (Ellis, 1994:314). Since most "underprepared" students have well developed "cognitive capacities" for oral communication in their first languages, such "capacities", especially the rhetorical structures, can be integrated into the students' classroom verbal communication and project presentations skills. Those skills form part of "secondary orality" or "scripted orality" (Ong, 1982: 82) that facilitates a transition from memory (L1) to written speech (L2). This facilitation is most useful where the learners use their L1 for learning L2 vocabulary through mnemonics or memory aides (Wenden & Rubin, 1987: 43). Since the township and rural schools "underprepared" learners are used to memory based knowledge retrieval cues, it should be possible, in my view, for them to use those L1 cultural norms in translating new vocabulary and knowledge structures into their interlanguage structures or target language. Such a transfer will, however, have to be a positive one.

Most "underprepared" students need facilitation of that transition from their memory regulated L1 to the writing literacy of tertiary education. Such a facilitated transition could also be a means of helping the students to adjust to unfamiliar environments of technical education.

2.3.4 Interlanguage

Trosborg (1995:53) defines interlanguage as "The language system (s) developed by the learner on his/her path to acquire the target language.....". Interlanguage is based on the assumption that L2 learners pursue a developmental route to being a competent bilingual. This process is influenced by factors such as the learner's age, L1 background and the context of L 2 learning and acquisition (Trosborg, 1995:53). Yip (1995: 14 – 15), however, identifies interlanguage as a hypothesis for explaining the mental structures that organize interlanguage grammar.

Yip (1995: 14 – 15) identifies four approaches to interlanguage formation: (1) the cognitive approach which views language as a cognitive system, (2) direct translation approach which places an emphasis on "transfer" as a mechanism that enables learners to translate directly from the L1 to L2, (3) the process approach which emphasizes inferencing, formulating, testing and sampling of interlanguage hypothesis and (3) , the creative construction hypothesis which de-emphasises the L1 role by encouraging the discover of universal tendencies, such as universal grammar (UG) of interlanguage, that operate on the L2 learner regardless of the L1 background.

A fundamental assumption of interlanguage is that learner language is permeable, dynamic and systematic (Yip, 1995:L 53). Its permeability lies in the fact that the interlanguage rules are not fixed but open to amendment, change and adaptation according to the L2 learner's developmental needs (Yip: 1995: 53). Even the learner language errors have to be seen in this light of permeable interlanguage formation.

Taking a larger view, Preston (1999: 69) argues that learners are putting together "a competent but distinctive system ... which gives them a place in the speech community (or communities) where they intend to interact, such interaction being open to the various means available for the study of language in its social context".

2.3.5 Variable L2 competency

Ritchie & Bhatia (1996:53) argue that "The domain of a L2 acquisition theory is not the behaviour of speakers (linguistic performance), but rather the mental system (competence) underlying that behaviour". Such a mental system is governed by its own interlanguage competency rules that differ from those of the L1 competency regulating "universal grammar" (UG) (Ritchie & Bhatia, 1996: 52). Unlike Ritchie *et al.*'s internal competency model, Ellis's (1994) model usefully distinguishes between external and internal SLA competency factors.

2.3.5.1 External competency

Ellis (1994:198-229) focuses on the "internal" and "external" SLA factors underlying a learner's attitude toward a target language. Such external factors include "age", "social class", and "ethnic identity" (Ellis, 1994:198-229). The ethnic identity factor, in my experience, is one of the strongest L1 cultural variables impacting on SLA of, for example, L1 Xhosa technikon students in the Eastern and Western Cape.

Ellis (1994:207) argues that there is general consensus that ethnic identity can exert a profound influence on L2 learning. He distinguishes three types of this influence: normative, socio-psychological and socio-structural (Ellis, 1994:207). In rural and township environments the use of L2 English is sometimes frowned upon, especially

by semi-literate and illiterate community members. Although such members consider English L2 to be a "social status" language, they dismiss its public usage as "ukukumtsha" or "speaking in a foreign tongue". Such anti-ukukumtsha L1 attitudes sometimes surface in the Xhosa "underprepared" technikon students' self constituted study groups where English L2 is also used.

These anti-ukukumtsha attitudes sometimes have ambivalent ideological stances because, for example, the community political meetings are usually conducted in a mixture of English and Xhosa. It seems, therefore, that anti-ukukumtsha is a social class defence posture by semi-literate and working class community members.

This ethnocentric attitude to their L1 is often one of the major factors which negatively affect "underprepared" students' acquisition achievements in L2 by widening the L1-L2 distance (Ellis, 1994:207). That attitude also has a potential effect on the learners' choice of a target language variety (Ellis, 1994:207). Such an effect results in an L2 of a Xhosa or Zulu "underprepared" student becoming strongly mother tongue or L1 accentuated. Such an accentuation suggests an L1 "transfer" into SLA. The concept of "transfer" will be treated in detail later in this chapter.

Other external SLA factors are learner input, interaction and output acquisition variables (Ellis, 1994:246 and 280). Ellis (1994:246) also distinguishes between the input text, i.e., native like speech or form of writing of the native speakers, and "input discourse" that is used in addressing the language learners. He also delineates an "input frequency" that determines an order in which some linguistic items are structured or sequenced in the acquisition input and developmental patterns of a learner (Ellis, 1994: 73 – 76).

Internal SLA factors are considered next.

2.3.5.2 Internal competency

In the next section only the "language transfer" internal factors will be discussed because of their relevance to linguistic underpreparedness. The cognitive internal factors are, however, given detailed treatment in Chapter 3.

2.4 Language transfer

Ellis (1994:302) defines transfer as concerned with the L2 type of learner errors that are produced during the acquisition process. He distinguishes between two types of transfer: negative and positive transfer (Ellis, 1994:302). Whereas negative transfer refers to L1 interference in L2 acquisition, positive L1 transfer facilitates L2 learning (Ellis, 1994:302). Negative transfer is also considered an imposition of grammatical and syntactic resources of a native language (NL) on an L2 (Ritchie & Bhatia, 1996:318). This leads to underlying errors in the sentence surface structures.

An example from "underprepared" students' L2 dialect that illustrates negative transfer from the L1 is when a Xhosa or Zulu speaker says "*I know that person*" (*Ngiyamazi lomuntu* [Zulu] or *Ndiyamazi lo mntu* [Xhosa]). Such a speaker can be assumed to know the person's name, but in Zulu or Xhosa speech this sentence has a double meaning: *I think I know or must have met this person somewhere.* And the speaker may not actually know the person's name and he/she does not have to justify his statement in Zulu or Xhosa discourse. This L1 speech pattern is meaningless and even likely to lead to a confusion of subject and object in L2

discourse. Other transfer stances such as the "minimalist position" or error types counting, "the interference in language contact situations", the "word order studies on transfer" and the "minimalist theoretical position" try to explain, from different perspectives, the notion of transfer (Ellis, 1994:309-314). These stances help in defining the technikon students' L2 developmental patterns.

Other SLA aspects, inasfar as they are salient to this study, such as L2 classroom acquisition, discourse analysis, bilingualism and the attitudes of adult L2 learners are examined in the next section in the next section. Given the interdisciplinary nature of this study, these aspects are not given detailed attention.

2.5 CLASSROOM SLA

Classroom SLA is concerned with either the concurrent acquisition of two or more languages (bilingualism or multilingualism) or with a non-simultaneous acquisition of an L2 (Ellis, 1984:2). However, the principal distinction that is drawn by Ellis (1984:1) is between naturalistic and classroom "second language development" (SLD).

SLD is a mentalist process with two distinct characteristics (Ellis, 1984:15):

1. Internalisation of new linguistic knowledge, i.e. forming interlanguage.
2. L2 performance which accounts for the learner's use of his/her available L2 knowledge in receiving and producing messages in the target language.

Both these processes are crucial in determining the "underprepared" students' potential for forming an interlanguage and producing classroom L2 messages in a target language. The interlanguage system should not only be formed, but it should also be revised continually by the learner as evidence of L2 acquisition development (Ellis, 1994:15; Boughey & Van Rensburg, 1994).

Most "underprepared" students struggle with formulating the spoken L2 classroom register, such as asking lecture related questions. The result is often a failure by the students to "automatise" or use spontaneously their L2 knowledge in authentic communication (Ellis, 1984:153). This failure is unfortunate, where it occurs, because the classrooms are input environments for fostering an accelerated L2 development (Ellis, 1986:232). There is a need, therefore, for classroom stimulation of the students' capacity for spoken communication. The feedback they get should encourage them to be active L2 acquirers that can self monitor their L2 development. Interaction in the classroom, therefore, should facilitate acquisition and encourage it (Preston, 1999: 69).

However, even if a classroom SLD is acquired in a learner-centred instructional environment, there is no guarantee that such acquisition will facilitate performance in another activity (Ellis, 1986:238). The key to that L2 "transfer" lies in metalinguistic L2 skills or strategies acquisition for the learner's SLD control (Ellis, 1986:238, Perkins, 1992:xvi). An example of this transfer is that learners who can self-monitor their L2 performance are "able" to read quickly and easily (Bialystok & Ryan, 1985:255-217). Self-management of L2 acquisition is therefore one of the strong indicators of acquisition success (Bialystok & Ryan, 1985:215).

Leung & Franson (2001:166 & 174) contend that classroom SLA pedagogy, especially that of ESL or ESP targeting "underprepared" learners, needs to be mainstreamed into the learning/teaching curriculum of content subjects so as to avoid isolating or insulating the learners from competitive learning demands. Mainstreaming also serves a useful function of integrating the classroom L2

language skills with course content (Leung & Franson, 2001:172). The next section considers discourse analysis.

2.6 DISCOURSE ANALYSIS

According to Van Dijk (1985:1, 2001) discourse analysis concerns a study of the uses of language in use, especially in domains such as representations of gender, news media reporting, enactments of power, racist discourse. Critical discourse is most important aspect of discourse analysis. Critical discourse explores the structures, strategies or other properties which are operative in various modes of discourse production (Van Dijk, 2001: 300). Its importance lies in the fact that it enables the subjects of discourse to challenge the (re)production and enactments of power, inequality and social dominance (Van Dijk, 2001 300).

Larsen-Freeman (1991:69-74) suggests that the value of discourse analysis lies in its use in exploring the "conversation", "classroom" and "speech act analysis" of SLA situations. Ellis (1984:17) provides a useful distinction in undertaking exploration. He distinguishes between "planned" and "unplanned" discourse situations. The former is thought out prior to expression, e.g. preparing a lecture or drafting an academic essay, and the latter is spontaneous, naturalistic and lacks communicative forethought (Ellis, 1986:266).

Tannen (1985: 204) posits a "cross-cultural" view of discourse analysis that emphasizes communicative aspects such as paralinguistic signals and prosodic features which establish cohesion or show relationships between ideas (What is the foreground? What is the background? What is cause? What is effect? What is given,

what is new?). Since most “underprepared” technikon learners come from rote learning school backgrounds, they are often unable to discern the significance of the kinds of choices their lecturers and other technikon campus personnel make. Being able to identify these would seem of particular importance for students within an academic environment (just as it would be for lecturers and others to mediate their discourse), With appropriate “contextual cues” (Tannen, 1985: 204), it would be possible to demystify these discourse features, and consequently appropriately interpreted by “underprepared” students.

2.6.1 Discourse context

A discourse context, according to Brown and Yule (1983:38), involves the social roles of “addressor”, “addressee”, “audience”, “topic”, “setting”, “channel”, “code”, “message form”, “event” and “purpose”. Most "underprepared" learners fail or struggle to deploy these discourse aspects in communicative situations. One example of this is that since those students often have severe incapacity for topic analysis, this can result in poor academic performance, failure and even technikon drop out.

2.6.2 Situated meanings

Whenever we speak or write, Gee (1999:11&12) maintains, we are continually constructing areas of reality. To penetrate and understand that reality from within, it is necessary to have “thinking devices” or the “tools of critical enquiry” that establish meaning for specific situations. It is also necessary for students, the "underprepared" ones in particular, to critically analyse reality so that they can see its organization

through the networks of micro (small) and macro (bigger) networks of situated meanings (Gee, 1999:43). Such meaning networks are termed "cultural models" (Gee, 1999:43). These cultural models can facilitatea transfer of, for example, coursework coping skills from one course and discipline to another.

The next section explores aspects of the notion of bilingualism and its implications for technikon student underpreparedness.

2.7 BILINGUALISM

Bilingualism is a complex concept as works such as Spolsky (1999) and Baker (2001), for example demonstrate. This discussion of bilingualism is limited to a few of the basic concepts.

Boardsmore (1982:1) uses the term bilingualism to distinguish between "horizontal bilingualism" and "vertical bilingualism". Horizontal bilingualism is applicable where two distinct languages have an equivalent status in the official, cultural and family life of a group of speakers, while vertical bilingualism refers to a situation in which a standard language, together with a distinct but related dialect, coexist within the same speaker (Boardsmore, 1982:5). This is the case for most of the students in South Africa who speak an African language.

2.7.1 Natural and secondary bilingualism

Boardsman (1982: 8) also draws a distinction between "natural bilingualism", i.e. picking up of two languages by force of circumstance, such as in parallel language

learning situations, and "secondary bilingualism", i.e. where a second language has been added to the first one. In most technikons the secondary bilingualism model prevails in respect of English since it has usually been added as a result of formal schooling.

2.7.2 Bilingual proficiency

Cummins and Swain (1986:7) contend that bilingual proficiency is the goal in acquiring two or more languages. Such proficiency is reflected in respect of the possession of listening, speaking, reading and writing skills "abilities" and complete mastery of two different languages without interlanguage interference (Cummins and Swain, 1986:7). Preston (1999: 69) takes a more realistic view in arguing for a competent bilingual rather than a clone of a native speaker. Competence or proficiency may be linked to the age at which an L2 is learned, the contexts in which the two languages are learnt and an L2 usage domain (Cummins & Swain, 1986:7; Cummins, 2000:60). For Cummins (1989: 3) bilingualism is a means of countering minority students's failure and surface level English L2 development in Europe and North America. It is only through an understanding of why minority students fail that, according to Cummins (1989: 4), minority empowering programmes can be developed for promoting the linguistic talents and achievements of those students.

The term, "bilingualism through monolingualism", is used by Cummins & Swain (1986:105) to describe two bilingual teaching methods. These are: (1) The teacher's concurrent use of two languages, i.e., L1 and L2 back to back classroom language mixing [language mixing approach], and (2) The parallel use of two languages in

terms of time, person, lesson or by subject content [the separation or parallel approach] (Cummins and Swain, 1986:105).

2.7.2.1 Structured immersion and submersion approaches to bilingualism

Cummins (1989:35-37) contends that bilingualism can be defined in terms of the "structured immersion" or "submersion" viewpoints. Structured immersion programmes are said to essentially consist of English only (where English is the majority language) with some special steps taken to help the L2 learners acquire English. This approach has been described as a "sink or swim" L2 learning (Cummins, 1989: 35). The submersion approach, on the other hand, has been described as "transitional bilingual education" approach in that it allows for initial content instruction to be given in a learner's first language (Cummins, 1989:36).

Both the above approaches have been criticised. The main criticism of structured immersion is that it is a "sink or swim" bilingual approach which provides little assistance to, for example, minority students' acquisition of competence in the language of instruction (Cummins, 1985: 35). The submersion approach has also been criticised for reducing the amount of exposure to English and lead to students' underachievement in that language (Cummins, 1989:36).

As an alternative to both of the above bilingualism approaches, Cummins (1989: 36) argues for the French L2 immersion programmes in Canada that are taken by English L1 learners. The research data show that the standard achieved in the L1 has not been affected. Although initial instruction in those programmes is in French,

by the end of elementary school approximately 50% of instructional time is available for each language (Cummins, 1989: 36). These findings refute the "insufficient exposure" hypothesis. Similarly, the "linguistic mismatch" submersion hypothesis is also refuted by data which "shows that learners who are instructed through a minority language for all or part of the school day perform at least as well in the majority language (e.g. English in North America) as students instructed exclusively through a majority language (Cummins, 1989: 37). What should be noted, however, is the overt support for the L1 (in this case English) in the form of positive attitudes to it and in the form of language arts instruction (Lyster, 1999: 626).

It is necessary to summarise the implications of the above distinctions for "underprepared" technikon students' L2 English acquisition. Firstly, Cummins's theories have to be considered with caution because it is learners from the majority populace in SA who form a large pool of "underprepared" students. Ironically, since their languages are marginalised in a situation where English is the language of instruction and examination, they can be said to take on a minority position. Secondly, the "insufficient exposure" hypothesis holds true to some extent in the SA linguistic situation where socio-economic factors mean that contact between L1 and L2 English speakers is generally limited to schools and workplaces. The "linguistic mismatch" hypothesis does not hold true in the SA linguistic situation because the "underprepared" students, in most cases, use their L1 outside of their schools and in their homes. This is understandable because the majority of parents in township communities are either illiterate or semi literate and not proficient in English L2.

Another bilingualism approach is outlined by Baker (2002). Of the ten examples of aims for bilingual education that are listed by Baker (2002:193), three of them are applicable to the language situation in SA, with regard to the language needs of township and rural students. These are:

(1) To unify a multilingual society; to bring unity to a multi-ethnic, multi-tribal, or multi-national linguistically diverse state.
(2) To provide language skills which are marketable, aiding employment and status.
(3) To reconcile and mediate between different linguistic and political communities.

Although aims 1 and 3 are politically orientated, these often have to be applied in situations of social class determined linguistic conservatism like that of anti-ukukumtsha mentioned in point 2.3.5.1 above. Those attitudes also undermine inadvertently the goals of providing marketable language skills and enabling township and rural students to compete effectively for scarce jobs in the labour market. The key question is whether ways can be found for the value of acquiring another language to be seen without resulting in what is termed subtractive bilingualism. In subtractive bilingualism the learners do not maintain their L1, and in additive bilingualism they add their L2 to their linguistic repertoire. The latter results in learners becoming *balanced bilinguals* (NEPI, 1992b: 78-79; Ellis, 1994: 208).

Since an adult language learner's attitude often plays a critical role in determining the level of SLA attained, this point is considered next.

2.8 ATTITUDES OF ADULT L2 LEARNERS

A major problem that adult L2 learners may have a tendency to resist socialization that is the end product of child language acquisition (Larsen- Freeman, 1991). Thus, they may prefer to speak an accented L2 speech that identifies them as speakers of a particular L1 (Larsen-Freeman, 1991:163). L2 acquisition is part of "academic literacy" acquisition for student empowerment. This point is examined below.

2.9 SLA AND ACADEMIC LITERACY

The acquisition of a L2 is also considered an aspect of a much broader process of acquiring "academic literacy". Leibowitz *et al.* (1997:5) define academic literacy as linking the students' entry into disciplinary communities with their acquisition of formal contentions such as organising concepts and discipline specific methods of enquiry.

It is important to emphasise that proficiency in L2 is one of the determining factors in successful acquisition of academic literacy because it is through this language that most facets of academic literacy are mediated to learners. A central ingredient in acquiring academic literacy, the scientific concept is treated next.

2.10 SCIENTIFIC CONCEPT

The scientific concept, as used here, refers to the formal conceptual operations in an "underprepared" student's cognitive structure. The concept is examined by asking what factors underlie an "underprepared" students' "inability" or "incapacity" to use

formal conceptual operations in their technikon learning tasks? Is it because of previous "poor quality" home and school learning stimulation or is it because of inadequate intelligence that such students perform poorly academically? These questions will be considered through a review of Vygotsky's and Feuerstein's theories of scientific concept acquisition.

2.10.1 Vygotsky's scientific concept

Vygotsky's theory distinguishes between "everyday" and "scientific" concepts (Rieber, Cantor & Aaron, 1987:194). This distinction emphasises childhood learning experience as meeting the complex needs of the adult who later takes on many social roles (Rieber *et al.,* 1987: 195; Shippey, 1994:150-168). The distinction is also motivated by an understanding that while the "everyday" or "spontaneous" concept is essential to learning development, it is acquired naturally. The scientific concept is, however, developed through formal classroom instruction (Rieber *et al.,* 1987: 195). The latter process is often not successfully completed in the case of "underprepared" learners (see Miller and Bradbury, 1998: 103-104).

Vygotsky refines the distinction by contending that there are two processes in learner development: "There is development as maturation and development as instruction" (Rieber *et al.,* 1987:196). This distinction is fundamental to an understanding of the acquisition of secondary discourse such as academic literacy. In the next section the distinction as it relates to everyday and scientific concepts.

2.10.2 Everyday and scientific concepts

Vygotsky also distinguishes between "ontogenesis" (individual development) and "phylogenesis" (group development) (Rieber, *et al.,* 1987:176). According to this distinction, individuals develop from homes where they first become exposed to the everyday concepts before they move to the schools and technikons or universities. One of the purposes the latter institutions is to train the students (Vygotsky's "child" subject is substituted with the "student" or "learner") in mastering the abstract scientific concepts that define their "maturation" (Rieber, *et al.,* 1987: 176).

Thus, the learning maturation of a learner, an "underprepared" one in particular, is a complex process that takes off within group (phylogenetic) learning, but is sustained through individual (ontogenetic) learning. Most "underprepared" rural and township students, because of their "communitarian" (Emeagwali, 2003) social backgrounds, tend to have a stronger group learning propensity and a weaker capacity for sustaining independent and self-directed learning.

Vygotsky (in Rieber *et al.*, 1987:169) poses the following critical questions regarding instructed scientific concept development:

> Does the process involved in the internal development of concepts follow instruction like a shadow follows the object which casts it, not coinciding with it but reproducing and repeating its movement, or do both processes exist in a more complex and subtle relationship which requires special investigation?

Rote learning which characterises the instruction of scientific concepts "underprepared" students will have experienced encourages a mechanical "shadow

like" and uncritical emulation of the instruction process (Frost,1989: 48; Haiden, 2000: 1-2).

Such instruction fails to delineate the subtleties in the relationship between the everyday and scientific concepts. That failure leads to a learner's "inability" to perceive the analytic units in the instructed scientific concept (Davydov and Radzikhovkii, 1985:31-32).

The critical challenge, it seems, is to stimulate the students' capacity for integrating everyday concepts into their classroom, study group and examination situations. This suggestion is explored further from the viewpoint of an instructed scientific concept.

2.10.3 Instruction and the scientific concept

Vygotsky emphasises the fact that "...with the appropriate educational programme the development of scientific concepts outstrips the development of spontaneous concepts" (Rieber *et al.*, 1987:168). This implies that the acquisition of the scientific concept depends on appropriate instruction as well as on the learner's creation of a continuum between his/her successfully used scholastic coping strategies and those he uses at the technikon.

Regardless of poor learning conditions and inadequate instructional stimulation at some rural and township schools, it would seem that even rudimentary instruction can establish an underlying structure for future scientific concept development. It may be the case that in the "underprepared" students such a structure is impaired, but even its inchoate or fragmentary existence can be used as the basis for jump-

starting scientific concept acquisition. This observation reinforces Gee's (1999: 11-14) argument for the micro and macro networks of situated meaning around which reality, even if it is fragmented, is constructed.

Nevertheless, it is Vygotsky's zone of proximal development (ZPD) that creates possibilities for effective student academic performance improvement.

2.10.4 Zone of proximal development

Bruner (1987:15) describes Vygotsky's ZPD as requiring the knowledge of another concept, i.e., the second signal system. This signal system refers to the world as mediated by concepts and language (Rieber, *et al.* 1987:15-16). Its counterpart is a first signal system that operates biologically on the environment (Rieber, *et al.* 1987:15). This distinction has crucial implications for the study's concern with "mediated" development of a learner's scientific concept.

The ZPD takes the focus away from biological stimuli to the cognition defining linguistic and scientific concept. It can also be described as the "underprepared" students' "learning scaffold".

2.10.4.1 Scaffolded learning

Learning and mastery of the scientific concept require, in terms of the ZPD, the intervention of an adult or instructor who has to guide a learner without interfering directly in his/her learning development. This learning mediation is known as "scaffolded learning" (Yeld and Haeck, 1993:116). Bruner (in Reiber, 1987: 4) summarises this notion as follows:

> The idea of the ZPD focuses attention on the role of dialogue as a precursor to inner speech, in this case the dialogue between a more expert teacher and a less expert learner. Once a concept is explicated in dialogue, the learner is enabled to reflect on the dialogue, to use its distinctions and connections to reformulate his own thought. Thought, then, is both an individual achievement and a social one.

Illocutionary speech acts, which enable a less expert learner to develop his/her "cognitive ability" (Carrol, 1993), such speech acts can best be accommodated in an alternative curriculum (Yeld and Haeck, 1993). That curriculum should allow for adequate investment of time and stimuli in scaffolding the students' cognitive development. The technikon "bridging" or preparatory programmes crystallise this process. These processes are discussed in detail in Chapter 4.

2.10.5 Zone of actual development

Vygotsky also distinguishes between the ZPD and the "zone of actual development" (ZAD) which defines the actual state of cognitive development (Rieber, *et al.* 1987:220). This distinction characterises the ZPD as normative and the ZAD as a reflector of the actual level of development.

The above distinction is summed up in Vygotsky's (Rieber *et al.* 1987:220) statement that the strength of the everyday concept is found in spontaneous, situationally meaningful and concrete applications in the realm of experience. The development of scientific concepts begins, however, in the domain of conscious awareness and volition and grows downward into the personal experience path. Consequently, its development depends on the level of a student's conceptual consciousness.

For Vygotsky the everyday and scientific concepts take two distinctly different development paths. Whereas the former moves from bottom up, the latter moves from top down the experiential hierarchy of learning development. But the strength of the scientific concept lies, according to Vygotsky, in its ability to restructure and raise spontaneous concepts to a higher level (Rieber *et al.* 1987:220).

Thus, the development path of the spontaneous concept is informal and less organised than that of the scientific one. Because of the relative strength of the oral spontaneous concept in "underprepared" students, they therefore struggle to comprehend the processes of scientific concept acquisition.

Feuerstein's cognitive model is examined below.

2.11 FEUERSTEIN'S COGNITIVE MODEL

Two aspects of Feuerstein's cognitive model will be discussed. The theory of Mediated Learning Experience (MLE) will be considered first and the distal and proximal determinants will be considered next.

2.11.1 Mediated learning experience (MLE)

Central to the notion of MLE is the concept of "cultural deprivation". Feuerstein *et al.* (1991:13) maintain that academically underprepared, underachieving or performance retarded children often exhibit cultural deprivation. However, he distinguishes it from the notion of "cultural difference" by arguing that:

> In terms of the theory of MLE, the deficiencies responsible for retarded cognitive performance are conceived of as belonging to the syndrome of what we refer to as cultural deprivation. Because of the pivotal role attributed to the concept of cultural deprivation as a conceptual link to our understanding of the phenomenon of retarded performance, it is important to realise that our definition of the term "cultural deprivation" is very different from that often encountered in the literature (Feuerstein, Rand & Tannenbaum, 1991:13).

Cognitive performance "retardation" or "impairment" is a major inhibitor of a student's cognitive development. As a result of that impairment most of the "underprepared" students are "unable" to perform effectively in competitive technikon academic situations.

Such "inabilities" stem, mostly, from previous rural and township environments with low school competitiveness. That low competitiveness results from "communitarian" (Emeagwali, 2003) rural and township cultural backgrounds that de-emphasise competitiveness by promoting "cultural uniformism" and hegemonic cooperation. Although those communitarian values have good moral rewards, they also have inadvertent effects of snail pacing the learners' cognitive development.

The concept of MLE unlocks that cognitive snail pace and *cultural deprivation syndrome* that is symptomatic of reduced cognitive modifiability in an individual, in response to direct exposure to sources of stimulation (Feuerstein *et al.,* 1991:15). Cognitive modifiability is a mediated language stimulator whose impairment leads to less task effort and demotivated learning.

Learning behaviour modification happens, according to Feuerstein, regardless of the condition and symptom of cognitive underpreparedness. He introduces the concept

of *cultural disadvantage* as underlying the cultural deprivation syndrome. He maintains that

> there are no necessary causal links between cultural difference or conditions of disadvantage, such as poverty and discrimination, and cultural deprivation. These conditions may overlap, however, and cognitive dysfunction may accompany any of (sic) three conditions (Feuerstein *et al.,* 1991:14).

2.11.2 MLE and deficient cognitive functions

Feuerstein *et al.,* (1991:73) identify four chief characteristics in deficient cognitive functions that are diagnosed through MLE. These are:

a. Impairments in cognition at the input phase
b. Impairments in cognition at the elaboration phase
c. Impairments in cognition at the output phase
d. Affective-motivational factors

The type (a) factors relate to errors or deficient skills in gathering data for qualitative and quantitative problem solving situations. The latter include blurred and sweeping perceptions, i.e., unplanned, impulsive and unsystematic exploratory behaviour.
Type (b) factors include an inability to identify and define a problem and an inability to select the relevant cues in defining a problem and narrowness of the mental field.
Type (c) factors include egocentric communication modes, deficiency of visual transport, impulsive behaviour affecting the nature of the communication process.

The type (d) factors refer to a combination of cognitive impairment factors collectively affecting an "underprepared" student's performance of academic tasks such as essays, tests and real life situations (Feuerstein *et al.,* 1991:73-74).

Feuerstein's "distal" and "proximal" structural concepts present a bimodal differentiation of the cognitive facets. These concepts are examined next.

2.11.3 Distal determinants

Feuerstein et *al.* (1991:17) contend that the

> [d]istal determinants include such variables as genetic factors, organicity, level of environmental stimulation, emotional balance of child or parents, and socio-economic status. When these factors are deficient in some respect, for example, low socioeconomic status, poverty of stimulation, or emotional disturbance of a child or parents, they can, but do not necessarily, lead to inadequate cognitive development. Thus, the distal etiological factors are defined as determinants that neither directly nor inevitably cause retardation.

With the exception of genetic factors, the distal factors are extrinsic to a student's cognitive structure. Most of them are environmentally determined and they operate from outside an "underprepared" students' cognitive structure.

2.11.4 Proximal determinants

Regarding this concept, Feuerstein *et al.*, (1991:17) maintain that:

> On the other hand, the proximal determinant is a lack of, or reduced exposure to, mediated learning experience, the outcome of which is retarded performance. Any of the distal conditions may trigger the proximal etiology, so that, although the indirect distal determinants contributing to the retardation may vary, the end result is, nevertheless, the same qualitative dimension, i.e., retarded performance. Conversely, if appropriate strategies of mediated

> learning experience are provided, such that the barriers obstructing mediation are overcome or bypassed, then it becomes possible to avert the course of retarded development and to restore a normal pattern of cognitive growth.

These factors operate from within a cognitive structure and are therefore intrinsic to its function/dysfunction. It is through their stimulation that retarded performance is overcome so as to set effective and volitional learning in motion.

Intrinsic cognitive structural impairment is likely to contribute more to "academic disadvantage" than factors such as poor socio-economic backgrounds and commuting between home and campus. However, the above distal, socio economic and poverty factors, can trigger intrinsic cognitive impairment. Thus, they also need to be considered simultaneously, but through separate programmes, with the proximal ones.

2.11.5 Distal and proximal model

Proximal factors have a major impairment impact at the cognitive input level. Table 2 depicts the various ways these factors can manifest themselves in "underprepared" students.

Pre-technikon learning experience	Distal factors	Proximal factors
Poor secondary schooling experience	Genetic intelligence endowment?	Attitude toward institutional, instructional and learning culture
No family technikon alumni	First generation technikon students	Receptiveness to L2 linguistic input
Orality as a dominant mode of communication	Written cultural discourse limited to school learning activity	Immersion in written communicative discourse
Illiterate or semi literate family backgrounds	Low income families	Peer help and sharing of resources
Distance between school and home	Commuting students	Maximum use of technikon learning time & facilities
Lack of library facilities and reading material	Inability to use library resources effectively	Rigorous data gathering, ordering, analysis and reading training
Lack of technological exposure	Parents cannot afford to buy computer technology	Entry level computer skills training

Table 1: The distal and proximal model (Adapted from Feuerstein, 1991)

The first column describes the types of pre-technikon learning experiences that often conceal the school underpreparedness baggage brought by a learner into first year technikon study. Some of these experiences would differ from learner to learner and also between rural and township students.

The second column lists the distal (extrinsic) variables that are independent of the innate cognitive impairment situation. The third column presents those independent variables that can be varied by the instructor and learner in modifying the learning behaviour. The latter facilitate a reversal of cognitive impairment and can scaffold the linguistic, written and scientific concept acquisition.

2.12 CONCLUSION

In this Chapter, literature on technikon education, SLA and scientific concept acquisition and development was reviewed. Particular attention was given to theories and concepts such as classroom SLD, variable competency, discourse analysis, interlanguage, input acquisition and bilingualism which have an immediate relevance to the L2 situation of the "underprepared" students. It was contended that the role of language attitudes like “anti-ukukumtsha” can frustrate process of acquiring English as a second language.

The section on the scientific concept acquisition considered Vygotsky’s notion of everyday and scientific concepts as the *crux argumentum* of his theory of individual (ontogenesis) and group (phylogenesis) learner scientific development. ZPD and ZAD were considered useful tools for scaffolding and mediating learning development.

Feuerstein’s cognitive modifiability, MLE, and proximal and distal concepts were also explored. The exploration emphasised the intrinsic potential of the proximal concept for reversing the core structural impairment condition. The solution to cognitive impairment, as Feuerstein’s literature suggests, should be sought proximally from within an impaired cognitive structure.The distal and proximal model, in particular, emphasised the reversibility of learning impairment factors, including distal factors like poverty and home overcrowding, with the exception of genetic factors. It was, however, recommended that parallel intervention strategies should be used in correcting both forms of impairment.

CHAPTER 3

ACADEMIC AND VOCATIONAL SKILLS IMPAIRMENT

3.1 INTRODUCTION

Some theoretical insights from work related to the reversal of cognitive (including, metacognitive and other forms of learning impairment) "impairment" in "underprepared students"[16] are explored in this Chapter. The concept of "impairment" is adapted from Feuerstein, Klein & Tannebaum, (1980:73). It is used here to describe "weak" academic performance of "underprepared" students. The context for the investigation is vocational and career technikon education.

The Chapter has three objectives. Firstly, it explores the "empowering" effect (Cummins, 2000; Clegg, 2001) of enhanced L2 English proficiency on "underprepared" students' academic performance. This exploration will be restricted to the transforming South African (SA) technikon higher education (HE) subsector. It will be contended that the effects of this kind of L2 English "empowerment" have a pedagogical transcendence that cannot be confined to the interactive classroom dynamics.

Secondly, the Chapter examines possible reversal of cognitive and metacognitive student "impairment" within vocational and career technikon pedagogy (Sternberg, 1990; Feuerstein *et al.,* 1991; Mehl, 1991 & 1993; Engelbrecht, 1992; De Villiers 1998). Although Feuerstein *et al.,* (1980: 73) limits the impairment concept to

[16] The terms student and learner will be used interchangeably in this chapter.

describing "deficient" cognitive functions, the study uses it broadly to describe the challenges inhibiting successful "second language" and "scientific concept" acquisition and deployment by "underprepared" students.

Thirdly, it suggests the value of experiential learning and "indigenous knowledge systems" (IKS) in stimulating learning achievement of "underprepared" students (Veldman, 1989; Engelbrecht, 1992; Goduka, 1999; Seepe, 2000).

It is assumed that an impairment of second language proficiency and cognitive/metacognitive student capacity affects adversely the level of performance of even a gifted learner (NEPI, 1992b; Ministry of Education, 2001).

The inclusion of "indigenous knowledge systems" and its possible role in "recognising prior learning" (RPL) experience could be an important stimulator of the students' academic and vocational capacity that could even be incorporated into their technikon "cooperative education" training.

3.2 ENGLISH L2 AS A GATEWAY TO CROSS CULTURAL IDENTITY

Cummins (1976, 1981a, 1989, 1991, 2000) has consistently advocated the linguistic empowerment of American minority non-native English speakers/users through a bilingual L2 acquisition process. For him L2 empowerment depends on a transformative pedagogy in which the classroom identity of learners and teachers is jointly negotiated (Cummins, 2000:253). He also argues that in the case of English L2 acquisition this process consists of two principal strata: (1) the effectiveness of the instruction in fostering learning or knowledge generation and (2) the impact of

instruction on the way students view themselves, or on the variously presented options for future identity choices (Cummins, 2000: 254).

The first stratum is closely related to the second one in that 'to learn a second language is a commitment to a second culture, and people who learn to speak two languages are, therefore, very likely to be quite different from those who stay unilingual' (Cummins, 1986:4). Within the lecture room and related teaching_and learning situations, there are a number of "democratic" interactional options for lecturers and students. These options reflect the respective positions of power.

According to Fairclough (1989:43), the one option is monolingual and monocultural classroom transmission, and the other is cross lingual and cross-cultural discourse transmission. The term "discourse of power" is used by Fairclough (1989:43) to refer to the balance of power in a classroom situation. The first option would place power in the hands of a lecturer, and the second one is based on negotiated power.

Cummins's linguistic empowerment theory is, however, a context bound theory in that it is based on the resistance to bilingual "immersion" education in some American and Canadian states, schools and academic settings (Cummins, 1986; Cummins, 2000). It is important to recognise the differences between the context of Cummins's research and that of SA technikon settings. The difference lies in the fact that the majority of technikons offer some form of language support or even have Afrikaans L1 and English L2 parallel instructional streams (Ministry of Education, 2001; NEPI, 1992).

Both of these approaches and the English second language (ESL) programmes have been criticised for their low or complete lack of cross-cultural input (Seepe

2000: 46). The parallel programmes may meet the needs of Afrikaans speakers, but they are not designed to take account of the needs of other language groups like the speakers of other official SA languages.

One of the decisive factors in the notion of L2 English empowerment is the relationship that English enjoys with a student's L1 (any other SA official national language which is a student's home language). If that relationship disaffirms a student's L1, the result is likely to be, as mentioned earlier, a low cross-cultural experience for the student (Cummins, 2000:36-37). If, however, the acquisition experience incorporates a positive L1 use for ESL development then the relationship is cross-culturally empowering (Cummins, 2000:36-37).

Cummins (2000:37) uses the term "additive bilingualism" to capture the flexibility of this linguistic empowerment in which "the students can add a second language to their intellectual tool-kit while continuing to develop conceptually and academically in their first language." At technikons the L1 of a township or rural "underprepared" student is rarely or ever used in formal teaching. Nevertheless, the possible role of the L1 in reversing a student's English L2 acquisition impairment, which reflects an underlying underpreparedness for meeting the demands of technikon study, needs to be explored.

3.2.1 Oral L1 competency and L2 acquisition

Successful acquisition by an "underprepared" student of proficiency in L2 English depends on the "ability" of an ESL programme to effectively use that student's strong L1 conceptual foundation (Cummins, 1981; 2000:184). This empowering or "positive

L1 transfer" (Ellis, 1985:6-7) plays a significant role in the mental processing by "underprepared" students of ESL lexical and semantic structures. At technikon level, mental processing is related much more to situated discourse. An L1 effect iscan be seen, for example, in Seepe's observation that the "underprepared" students have a tendency to make sweeping generalisations during physics examinations. This occurs often where, for instance, a word such as "both" is frequently misinterpreted for "all" (Seepe, 2000:29-30). In support of his view, Seepe cites the evidence of a Malawian L1 study's finding (Case, 1968:17) that there was no equivalent "ciTumbuka" word for "both" (Seepe, 2000:30).

There is some disagreement, however, on the optimum conditions for positive L1 to L2 transfer. Cummins (2000:182-183) argues for interdependency between the two languages. Working in a different context from Cummins, Gough (2000:47-50) explores what he terms "interdiscourse". This interdiscourse consists of an interaction and cross-fertilisation between, say, a L2 English and Xhosa oral genres. Such genres can include "formulaic expressions", "admonitions" and_other learner discourse input processes. This suggestion is in line with Cummins's (2000:47-50) concept of linguistic interdependency and cross-linguistic L2 acquisition facilitation.

Another view holds that a linguistic distance between the two languages should be maintained (Fishman, 1984:37-38; Seepe, 2000:32). Seepe, (2000: 32-36) warns, however, against a mixed use of English L2 and IsiZulu or SeSotho L1 without any significant L2 acquisition taking place. It should be noted that even if an "underprepared" learner "understands" input, there is no guarantee that such an input will be processed by that learner's internal mechanism (Ridge, 1996:9-10).

The problem with the concept of "understanding" as it relates to the situation of "underprepared" students in SA, is also raised by Lazarus, Miller, Craig, Morphet, Hunter & Scott (1989:155). It will be considered later in this chapter. It suffices for now to say that there is a need to explain the mechanisms that block an "underprepared" student's understood L2 intake from being produced successfully in L2 performance situations.

The difficulty in processing a mixed L1 and L2 input is increased in the case where the L1 has a strong oral culture as against a predominant L2 writing culture. Discussion of L2 English underpreparedness must be contextualised within the technikon vocational and career skills domain. The next section attempts to do this.

3.2.2 Vocational, career and L2 English proficiency

Technikons define themselves as vocational and technology oriented educational centres of excellence (Veldman, 1989:139; Engelbrecht, 1992; 32). This self-projection has implications for the type of L2 English course that is required. It is important to underline that SLA is not the same as the development of secondary discourse, as in the case of academic literacy. However, it would be simplistic to consider means of developing academic literacy which did not take the limited English of the participants in this study into account. Obviously, an English course will have to be a bit of a hybrid and should be vocational and career oriented, in close alignment with the educational "training" goals of the technikons and industry.

There are two reasons for this. Firstly, the students have to be empowered with the necessary skills for successful performance in a "sandwich" (content and technology-

mixed) technikon curriculum (Engelbrecht, 1992:31). Secondly, there is a need to ground an L2 English technikon course in cooperative education (or industry in-service training) that prepares the students for their technical careers (Engelbrecht, 1992; Veldman, 1989).

Both Veldman (1989:130) and Engelbrecht (1992:32) maintain that the acquisition of the values of vocationalism and career skills are central to technikon students' learning development. According to Veldman (1989:131) "this requires close cooperation between a technikon that provides theory training, the employer who provides the in-service training and the student". Engelbrecht (1992:31) goes slightly beyond Veldman's formulation by contending that the

> career oriented character of this co-operative educational model, in a fast changing technological era, necessitates close consultation with industry. The involvement of industry in helping to define the endproduct in terms of a career proficiency is not only useful but essential.

Engelbrecht (1992:31) defines this kind of technikon education as a "career proficiency profile" centred on the definition of academic and industry-specific tasks. Engelbrecht's task matrix, which is reproduced below, details these tasks (1992:34):

- Operating skills, not necessarily with tools, but with instrumentation and engineering drawing skills
- Technological knowledge, including experimenting skills, engineering methodology, translation of theory into practice, learning skills and technology comprehension
- Conceptual skills, comprising decision-making skills, problem-solving skills, analytical and practical design skills, and innovational skills
- Communication skills, including interpersonal communication and technical communication skills. The latter was subdivided into the

collection, utilization and presentation of technical information; the design of technical reports, publications and training documents; engineering drawing and graphical representations

- Management skills, comprising general management skills such as self-management, leadership, control and organization; and technical management skills such as planning and scheduling or work/procedures and also responsibility and accountability in a technical sphere

The task matrix is reproduced in full because it details the ingredients of career-oriented English L2 proficiency. Almost all of its items have major implications for the L2 English instructional goals and outcomes.

The first two points highlight some aspects of the career content of technikon education which will be discussed later in the section on indigenous knowledge systems (IKS).

The emphasis on technical aspects in the fourth bullet poses a critical challenge to lexical and other L2 aspects of proficiency. The notion of L2 proficiency, as used here, relates to the spontaneous or "automatic capacity" of learners to use academic L2 language (Cummins, 2000:60). It can be inferred therefore that L2 English proficiency is linked to a student's career proficiency profiling. Such a link is inherent in the notion of a "technician" whose skills combine academic knowledge, i.e., the linguistic and subject content, with operational performance, i.e., the industrial instrumentation (Engelbrecht, 1992: 34).

The above link is a challenge to technikon second language programmes. Not only should such courses be concerned to develop skills, but they also have to take account of course content, materials and learning outcomes of technikon career

proficiency profiles. The writing genres taught in technikon ESL courses should be closely aligned with the career profile criteria of the students.

3.2.3 Technical writing genres

The development of genres that relate to future jobs has to be grounded in a technical discipline as well as on generic features of English. Examples here are report writing approaches which lay an emphasis on the technical, i.e. mechanical, statistical and factual linguistic aspects of report-writing (Kaunda, Allie, Buffler, Campbell & Lubben, 1998: 122-123; Kaunda & Ball, 1998: 130 - 138,). These genres also cater for the students' lexical or conceptual development needs.

Another significant aspect that requires attention is the transition from the simple past to the simple present tense and *vice versa* in the technical report-writing genre. This is required because the genre of report writing uses a *post facto* reporting style. Therefore it is important to address these tense aspects since the report genre is a dominant means of industrial project communication (Burke, 2000: 250-254). It is frequently used in instances like plant accidents, industrial labour problems and feasibility studies (Kotecha, 1994; Skinner & Von Innes, 1996). Thus, it is necessary to incorporate written technical L2 English in a proficiency development course.

In the next section, an argument will be presented, along the lines suggested by Ellis (1985:159) and Ridge (1996:9), that no matter how good a L2 course material design may be, it cannot compensate for an "underprepared" student's poor L2 cognitive data intake and input processing. This will underscore the fact that "underprepared"

ESL learners process their intake information "differentially" and "individually" on the way to their L2 acquisition destination (Ridge, 1996; Ellis, 1997; Cummins, 2000).

3.2.4 English L2 cognitive linguistic potential

In his discussion of the learner's cognitive L2 linguistic acquisition strategies, Ellis (1997:76-77) argues that a successful L2 language intake takes place when the learner is faced with some problem, such as how to remember a new word. This situation would demand that the learner consciously devise a learning strategy to solve the problem. Thus, "learners are generally aware of the strategies they use and, when asked, can explain what they did to try to learn something" (Ellis, 1997:76).

Since "underprepared" students are often not aware of the strategies they use (or could use), they are therefore not able to make the consciously appropriate decisions when attempting to resolve their cognitive or linguistic problems.[2]

Ellis (1997: 77) identifies the conscious strategies as consisting of, among others, 'those that are involved in the analysis, synthesis or transformation of learning materials'. An example of such a strategy is "recombination" 'which involves constructing a meaningful sentence by recombining known elements of the L2 in a new way' (Ellis, 1997:77). Successful use of such strategies has plausible positive effects on the "underprepared" students' ESL proficiency confidence levels. Such a success can affirm their L2 acquisition potential. On the other hand, an inability to

[2] This aspect of cognitive impairment is also analysed empirically in the fourth and fifth chapters of the study.

achieve this kind of success is often responsible for the "underprepared" students' cognitive classroom passivity (Mehl, 1985: 28 - 40; Seepe, 2000: 46).

Cummins (2000:66) posits a different viewpoint that argues that contextual support reduces the cognitive demands of a linguistic task on students. Reduction of cognitive demand, Cummins cautions, should occur without compromising the content quality. He bases this viewpoint on the rationale of his four quadrant linguistic model (Cummins, 2000:66) in Figure 3.1 below.

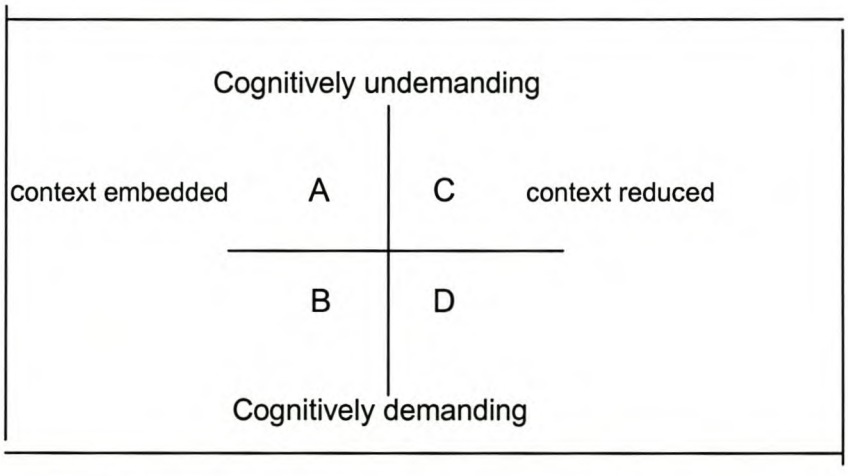

Figure 3.1: Proficiency model (Cummins, 1984:12)

The model consists of a cognitively undemanding but context embedded A quadrant; a cognitively demanding but context embedded B quadrant; a cognitively undemanding but context reduced C quadrant and a cognitively demanding but context reduced D quadrant.

A successful career-orientated cognitive linguistic student academic underpreparedness reversal will, it seems, have to function in the B quadrant. This is where linguistic support can be increased while retaining an appropriate cognitive load.

It is also in the B quadrant that cognitive linguistic curriculum adjustment has to be made in accommodating the "underprepared" students' linguistic cognitive needs (Hunter, 1991:5; Moulder, 1991:10; NEPI, 1992:76; Ministry of Education, 2001). Such an approach is appropriate to bridging or credit bearing first year foundation courses (Hofmeyr, 1989; Grayson, 1991; Hunter, 1991).

The challenge of ESL cognitive empowerment is to stimulate the "underprepared" students' capacity to be "reflective active" (Feuerstein *et al.*, 1980; Winberg, 1993b; Ridge, 1996:16-17). This is a capacity for self-monitoring their cognitive L2 acquisition performance (Ridge, 1996:16-17). Another important task is to facilitate the students' transition from cognitive L2 capacity to "cognitive academic language proficiency" (CALP) (Ridge, 1996:42; Cummins, 2000:55).

The implications of CALP are that the adequacy of the students' level of grade norms or L2 spoken and written "abilities" have to be assessed constantly by the instructors (Oller, 1979; Cummins, 2000:57-59). It seems, however, that these performance "abilities" can also be signaled through the students' attainment of an L2 self-assessment "competency".

Once an "underprepared" student is "able" to reflect differentially and individually on his/her strategies for analysing, synthesising and embedding the L2 meanings or stimuli (Ellis, 1994:370), such a student, it can be inferred, would be on a CALP path. Other L2 proficiency factors such as comprehension, meaning negotiation and verbal performance skill will also need to be assessed. That assessment can determine whether an "underprepared" student's L2 cognitive proficiency correlates with some of the L2 native-like performance characteristics (Ellis, 1994: 35-6).

This cognition notion suggests a need for "underprepared" students to be generally aware, as mentioned earlier, of their growth in knowledge acquisition. That awareness has to be stimulated at the technikon study commencement point and enabled to grow cumulatively until a student graduates and enters a vocational career (Krechevsky & Seidel, 1998:30).

The concepts of cognitive and "metacognitive" impairment reversal and success oriented potential academic performance stimulation are treated next.

3.3 COGNITIVE AND METACOGNITIVE IMPAIRMENT REVERSAL

This section has two parts. Firstly, it defines some cognitive concepts and theory aspects in relation to their role in cognitive impairment. Such concepts include Feuerstein's, *et al.*, (1980 and 1991) "instrumental enrichment" (IE) and the "learning potential assessment device" (LPAD).

A number of significant studies (Mehl, 1985 and 1991; Skuy, 1990; Adams and Adams, 1991; Frielick, 1991, Mentis and Zolezzi, 1992) have confirmed the relevance of these concepts to the SA higher education situation.

The second part considers some metacognitive concepts and constructs and their potential role in stimulating the students' successful performance.

The selected concepts have a confirmed usefulness in the SA higher education context (Sternberg and Williams, 1998; Cilliers and Sternberg, 2001). Both parts of this section will relate their discussion to Engelbrecht's (1992) vocational and career task matrix.

3.3.1 Key cognitive concepts

The five cognitive concepts to be defined are "cognitive performance impairment", "task planning ability" or cognitive "capacity", "effort in cognitive performance", "task strategy" and "self-management". It is worth mentioning that the separation between these concepts is arbitrary since they are sometimes interchangeably used in cognitive psychology (Nickerson, Perkins & Smith, 1985:101). The study will attempt, as far as possible, to attribute consistent meanings to these terms.

3.3.1.1 Cognitive impairment

The notion of cognitive performance impairment refers, in this study, to the weak state of the 'underlying functions upon which successful performance of cognitive operations depends' (Feuerstein *et al.*, 1991:70). This cognitive performance impairment view is also supported by Nicholls (1990:14-30) who identifies the notion of cognitive "difficulty" in performing certain academic tasks as a pointer to the underlying cognitive structural dysfunctionality.

3.3.1.2. Task planning

There is a divergence of opinion between Kirby (1984), Nicholls (1990) and Feuerstein *et al.* (1980 and 1991) regarding whether cognitive impairment results from a lack of academic task planning "ability" or from a lack of academic "potential"/"capacity". Kirby and Nicholls's conception of "academic planning ability" is considered first and Feuerstein's next.

3.3.1.3 Task planning ability

Kirby (1984:54) uses an information processing approach in terms of which the 'concept of planning ability (or abilities) is based upon a distinction between cognitive processes that act upon information and cognitive processes that act to control information processing'.

The notion of a "process" that undergirds this definition is, as Kirby (1984:4) points out, a major contributor to terminological confusion in the cognitive psychology field.

Nicholls's notion of "ability" is linked to the concept of "competence". Like Kirby (1984), he contends that the concept of ability can be linked to "intelligence". Nicholls (1990:14) goes further and implies that there is a binary distinction between academic ability/inability and competency/incompetency:

> The concept of ability enables us to address the questions about who is more able at a given activity. It is the concept we use when we want to know who is competent, whether socially, musically, or mathematically.

Nicholls' (1990:19) non-normative conception of ability, i.e., the holding of a positive belief that another's accomplishments indicate what one can do, is persuasive. However, most students, in my experience, need encouragement to adopt a non-normative and competitive attitude toward academic performance.

Nicholls (1990:26) also warns that no matter how hard an academic task may be, avoiding it or failing to perform it will contribute to academic failure. Academic failure itself is associated with academic incompetence. The failure avoidance orientation is common among "underprepared" technikon students, especially those with a history

of school failure (Anderson and Jennings, 1980:394; Louw & Smit, 1993; 383). These authors argue that such an orientation prevents "underprepared" students from achieving their full cognitive potential.

Nicholls (1990: 26) also argues that "if we doubt our ability, we will – when we construe ability as capacity – have less faith in the power of effort to raise our performance relative to that of others." This is contestable on the grounds that capacity needs to be distinguished from "global ability" (Feuerstein, *et al.,* 1980 and 1991; Nicholls, 1990:37) or competency.

Nicholls' notion of capacity *vis a vis* competency has merits, however, on the issue of the competitive nature of "ability". Such a notion seems suited to the situation of "underachieving" or low achieving but non-failing students" (Carr, 1991:108). This does not imply a rejection of the ability notion - as some of its aspects are relevant to the situation of the "underprepared" students. In fact even Nicholls (1990: 35) himself, later in the same article, contends circuitously that 'The concept of capacity is necessary if we want to tell how able we are'.

Feuerstein', *et al's* (1980 and 1991) conception of academic task planning "capacity" or "potential" of "underprepared" students' academic achievement is now examined. Instead of asking an underachievement and global ability question like why some students learn better than others (Andrade and Perkins, 1998: 70), a Feuerstein learning capacity question may reformulate that question. It may want to know from which "cultural background" the students come from and how such a background has shaped their responses to various learning stimuli (Feuerstein *et al.,* 1980 and 1991).

3.3.1.4 Task planning capacity

Feuerstein *et al.* (1991) dismiss both the notion of "static or immutable ability" and/or "static or immutable intelligence" as having no major bearing on cognitive impairment. Instead he posits a notion that it is "academic planning capacity or potential" that has to be stimulated for effective reversal of an "underprepared" student's weaker cognitive functions.

Feuerstein's notion of cognitive potential is determined instrumentally through a Learning Potential Assessment Device (LPAD). This instrument, according to Feuerstein, reveals an individual's underlying cognitive processes or structure (1991:xiv).

This means that "underprepared" technikon students have some form of school-nurtured capacity for planning successfully their academic task functions (Skuy, *et.al* 1990; Mentis & Frielick, 1991; Mehl, 1991). What those students often need is an activation of those planning capacities. This is possible through Feuerstein's "mediated learning experience" (MLE). MLE is a deliberate and purposive intervention of an expert mediator like a lecturer in a student's learning development (Feuerstein, *et al.,* 1991).

The stimulation of an "underprepared" student's underlying cognitive structure is likely to reverse cognitive underpreparedness. The latter is often responsible for the students' unplanned and uncoordinated task performances (Feuerstein *et al.*, 1980: 97; Mehl, 1991:13-14). Once the process of reversal is set in motion, a student's attention is then rerouted to the stimuli that will help him/her 'enumerate and sum the

required activities and compare them with the anticipated outcome' (Feuerstein *et al.*, 1980:98).

The usefulness of this concept for task planning functions has been confirmed in at least three SA studies. The first one is the University of the Western Cape (UWC) case study by Mehl (1991). Mehl studied the cognitive impairments of first year physics students as they attempted to solve the "kinematics" problem in their physics class. He reports that 80% of the first year class were failing physics before and at the time of the case study. After the cognitive potential of that group had been assessed, presumably through the LPAD, they were then taught using MLE. Their cognitive performance, as well as their tests and examination scores, improved greatly as a result of that MLE exposure (Mehl, 1991:166-168).

Mehl (1991: 168) also used the students' own negative capacity for unplanned, impulsive and unsystematic exploratory behaviour to stimulate their cognitive task-planning potential. Such an intervention led to the cognitive potential realisation in the samples' improved test performances and course grade scores.

There are other two separate studies by, respectively, Skuy (1990) and Zolezzi (1992:103) in which these capacities were also used in stimulating the students' cognitive performance. Skuy and his team (1990) applied the cognitive potential concept in cognitive enrichment of adolescents and their teachers. They also used it in designing a study skills course. Zolezzi applied it in investigating alternative selection and admissions measures for undergraduate students at Witwatersrand University (1992:103).

The notion of a cognitive planning capacity is closely linked, as Nicholls (1990:35) points out, to that of academic performance "effort" which is discussed below.

3.3.1.5 Cognitive performance effort

The concept of "effort" in the "underprepared" students' capacity for task performance is given incisive attention by Carr (1991:108-109). She links it to affective motivational components of a student's academic underachievement performance. Ridge's (1996:15) caution against drawing a simplistic link between cognitive capacity stimulation and short-range or single-lesson based motivational objectives is also noted.

It should, however, be stressed that there is a fundamental difference between academic "underachievement" and "underpreparedness". The former identifies the average but non-failing student as its focal point (Carr, 1998:109), and the latter is concerned with the position of those first year students that are failing their tests and examinations. The latter are often a product of previous school "cultural deprivation" and cyclical failure (Maxwell, 1979; Feuerstein *et al.,* 1991). Such a definition does not exclude the possibility of an underachieving student being "underprepared" as well.[18]

Carr (1991:109) mentions that underachieving students tend to attribute the success of their academic performance to external uncontrollable factors, such as "luck", rather than to their own efforts. Nicholls (1990:21-26) makes a similar observation.

[18] `Determination of a "degree of underpreparedness" in a particular student requires an application of appropriate cognitive assessment instruments which are a specialised field which lies beyond the scope of this study.

This tendency is associated with low self-esteem and expectations of external reward, such as a lecturer's praise, for successful academic performance.

The above attitudes often account for underachievement factors (Moody, 1993:51), as well. If these attributional attitudes are applicable in low achieving but non-failing students, it can be inferred that their effect in the cognitive impairment situation of "underprepared" students could be aggravated by the students' inability to relate their academic achievement to their self-esteem and motivation.

Another factor that inhibits the application of effort as well as intrinsic motivation is the fear of examinations. This fear is related to prior learning experience (Gjesme, 1983; Smith, Arnkoff & Wright 1990). Most of the failing technikon "underprepared" students, in terms of NEPI (1992b) and the Ministry of Education (2001), have a history of past school examination failure.

There is another factor: often the cognitive efforts that students of this kind put in their task planning, tests and examination preparation is not goal orientated (Smit and Louw, 1993:381-383). It is often spurred on by a "poverty of the stimulus" (Feuerstein *et al.,* 1991:78-80). The latter relates to a lack of cognitive effort stimulation which leads to academic failure (Maxwell, 1979: Gjesme, 1983; Carr, 1991; Feuerstein *et al.*, 1991; Coleman, 1993; Moody, 1993; Savage, 1993). Closely related to the concept of effort is the notion of a task strategy which is considered next.

3.3.1.6 Task strategy

A central tenet in this study maintains that it is necessary for a learner, an "underprepared" one in particular, to have a "strategy" or sequential method for performing successfully the given academic tasks (Dickson, 1983: 267; Biggs, 1984:111; Das, 1984:36; Kirby, 1984:5). Failure to employ a strategy is probably one of the key indicators of cognitive underpreparedness. The notion of a cognitive strategy refers here to a hierachical goal orientated sequencing of actions, evaluations and conditional actions to be carried on until a desired set of goals is attained (Kirby, 1984:56).

An example is that of a technikon technical report writing task whose successful performance depends on a student's execution of a hierachical action sequence or sub-plans. In this case the potential of an "underprepared" student for task topic analysis, data gathering, data control and integration, writing, proofreading and editing have to be organised sequentially in attaining that report-writing goal. However, where the "potential for successful academic performance" is deficient, a learner is likely to display a correlation between a strategy lack and low self-esteem (Carr, 1991:108-109).

Although Carr (1991:108) uses a non-differential concept of ability in constructing her arguments, her most important observation, for purposes of this study, is found in her contention that:

> poorly chosen or poorly formed strategies are likely to be ineffective and will eventually lead to diminished academic self-esteem and externalised attributional beliefs (e.g., the conviction that luck produces good performance).

Underprepared students do sometimes rely on luck in performing critical tasks such as tests and examinations. This happens especially where the students have to answer multiple-choice questions. This luck dependency is the product of a number of factors including the lack of capacity for "coherent patterning", "appraising", "retrospecting" (Norem and Cantor, 1990:192) and evaluating their responses in tests or examinations. It is this "meta-strategy" (Kirby, 1984:6) for self-evaluating one's set academic goals and performance that often needs to be developed for successful examinations performance.

Kirby (1984:123-124) also contends that there is a close correlation between learning motivation and the choice of a strategy that leads to successful task performance (Kirby, 1984:123-124). The strategies for academic task selection require the ability to self-manage an "executive" self-directed learning control function (Kirby, 1984; Sternberg, 1990).

3.3.1.7 Self management

Engelbrecht (1992:34) lists the self-management sub-item as a "skill" which constitutes one of the "general management skills" required in a student's/technician's work environment (see the Engelbrecht task matrix in 3.2.2 above). Included in this sub-item are other "skills" like control, organisation, planning, scheduling etc., which are required for vocational competency "skills" accreditation–as-well-as in terms of the National Qualifications Framework (NQF) requirements and the national skills development legislation.

Although Engelbrecht does not explicitly define his "skills" notion, it appears to be based on the concept of a "skill theory". In terms of this concept the 'Skills are best understood when they are described for a specific task because skills are the control of activity in specific domains and contexts' (Bidell and Fischer, 1992; Parziale and Fischer, 1998:107-106). This definition fits in with Engelbrecht's description of the self-management skill.

According to the matrix, Engineering students are required to demonstrate during, for example, a hydro-electric power station's peak electricity generation, their ability to self-manage job performance. That ability should, in terms of the task matrix, also be accompanied by a series of other specific job related tasks. This can mean a cognitive overload with an adverse effect on "underprepared" students' self-management ability.

The cognitive aspects of skill theory require a student/trainee technician to link his/her self-managed learning to the specific linear task sequencing (Brown and Yule, 1983:125; Parziale and Fischer, 1998:100-107). However, the skill theory tools also make provision for the unevenness of the learning development of a student/trainee (Parziale and Fischer, 1998:107). For progression from simple to complex learning and job skills, a student/trainee technician needs to have a potential for a "range of performances" in terms of which he/she is "able" to maintain the higher level of thinking complexity than can be used in familiar domains (Bidell and Fischer, 1992; Parziale and Fischer, 1998:107-109).

This has important implications for developing the cognitive self-management skills of an "underprepared" student/trainee technician. The implication is that the

performance of such "executive skills" (Petersen and Swing, 1983:273) has to be directed through the student/trainee's underlying "metacognitive" structure. These skills should, in the study's view, be incorporated into classroom learning and teaching for their integrated "metacognitive proficiency stimulation" (Petersen and Swing, 1983:273).

This section concludes with an examination of the application of Feuerstein's "cognitive modifiability" theory and other related cognitive underpreparedness reversal constructs.

3.4 COGNITIVE MODIFIABILITY

Feuerstein *et al.* (1980:9) defines his cognitive modifiability theory as 'directed not merely at the remediation of specific behaviours and skills but at the changes of a structural nature that alter the course and direction of cognitive development.' It is important for this intervention to aim at altering the whole course of cognitive structural impairment so as induce lasting changes in the cognitive state of an organism (Feuerstein *et al.,* 1980:9). The key construct for cognitive impairment prognostication, in terms of the cognitive modifiability approach, is the notion of "cultural deprivation".

3.4.1 Cultural deprivation

Feuerstein *et al.*'s (1980:13) cultural deprivation notion identifies a student's social distance from his culture as the nucleus of structural cognitive impairment. This approach contends that 'It is not the culture that is depriving, but it is the fact that the

individual, or his group, is deprived of his own culture that is the disabling factor' (Feuerstein *et al.,* 1980:13). Culture, for Feuerstein *et al.* (1980:13), is a dynamic intergenerational and value transmitting entity. The crux of this notion lies in its placement of the cognitive subject at the centre of the cultural world-view.

Thus, cultural deprivation places the deprived individual or group at the centre of a structural modification process. It makes no direct reference to an individual's extrinsic condition of disadvantage (Feuerstein *et al.* 1980:14). Such an approach has plausible usefulness for describing the township and rural conditions of cultural deprivation. Feuerstein's instrumental enrichment approach, which is considered below, has an immediate empirical appeal to the concerns of the study.

3.4.2 Instrumental enrichment

Instrumental enrichment (IE) is a strategy for the 'direct and focused attack on those processes that, because of their absence, fragility or inefficiency, are responsible for poor intellectual performance, irrespective of underlying etiology' (Feuerstein, *et al.,* 1980:1). The theory describes the "metacognitive" stimulation of 'the whole process in which the learning takes place' (Feuerstein *et al.*, 1980:1). The problem with Feuerstein's formulation is his interchanging usage of cognitive and metacognitive concepts. Since it is important to separate them for purposes of this study, these terms are therefore defined in point 3.6.1 below.

The major IE attack strategy lies in its explicit foregrounding of the strong and weak substructural cognitive components (Feuerstein *et al.*, 1980:103). Once they are made explicit, the next step is to stimulate an auto capacity for impairment diagnosis. IE can, therefore, be described as a tool for cognitive/metacognitive behaviour

modification. Its functional capability is realised through Feuerstein's learning potential assessment device (LPAD) which is discussed next.

3.4.3 LPAD

The LPAD identifies four categories of cognitive/metacognitive impairment which it assesses prior to MLE metacognitive "deficiency" stimulation (Feuerstein, Rand, Hoffman & Miller, 1980:72). These can be summarised as impairment at (1) input phase, (2) elaboration phase, (3) output phase and (4) motivational factors.

The impairments at the input phase relate to the insufficiency of the available data for task performance. This insufficiency leads to blurred reality perceptions or to an unreliable reference system (Feuerstein *et al.*, 1980:72).

The impairments at the metacognitive elaborational phase include inadequate problem definition, and a narrow mental field. The impairments under (c) include factors that lead to inadequate communication, e.g., impaired precision. One of the affective factors that come into play here is low motivation in respect of academic tasks, tests, and examinations.

Effective reversal of impairment in these four metacognitive categories is achievable through an intensive MLE application (Feuerstein *et al.*, 1980:9). That process is termed "MLE investment" by Feuerstein *et al.* (1980:15). The challenge is to relate MLE application to Engelbrecht's vocational and career task matrix. This challenge is even more pressing in the light of the National plan for HE's (NPHE's) concern for

technikon quality learning and graduation benchmarking (Ministry of Education, 2001:33).

3.5 IMPLICATIONS FOR COGNITIVE MODIFICATION

Instrumental learning behaviour modification can take place even in content-free teaching/learning settings (Feuerstein *et al.*, 1980:1). The pedagogical implications of such a learning setting is that it allows more time, effort, curriculum and course offerings to be devoted to making explicit the academic and vocational requirements for successful performance (Andrade and Perkins, 1998:73). This viewpoint is supported by the evidence of its successful application in Mehl's (1991) study sample. In the next section, close attention is devoted to metacognitive concepts.

3.6 METACOGNITION

This discussion begins with a definition of key metacognitive concepts. It goes on to examine Sternberg's triarchic intelligence theory and its possible role in stimulating "underprepared" students' academic success. It will conclude with a consideration of the possible contribution of metacognition to vocational and career preparedness.

3.6.1 Key metacognitive concept

Although many definitions of metacognitive concepts exist (see, for example, O'Neill and Spielberger, 1979; Kirby and Biggs, 1980; Pressley and Levin, 1983; Sternberg, 1997), only the two offered by, respectively, Nickerson *et al.* (1985) and De Villiers (1990) will be considered. Whereas the first one is universal in scope, the second one is informed by the South African context.

At the heart of the "higher order thinking skills" or definition of metacognitive skills by Nickerson *et al.* (1985:101) is effective regulation of cognitive planning:

> Metacognition may be thought of as cognitive skills that are necessary, or helpful, to the acquisition, use, and control of knowledge, and other cognitive skills. They include the ability to plan and regulate the effective use of one's own cognitive processes....

Clearly, metacognition entails "mental self-government" (Sternberg, 1997:19) or superior knowledge management functions.

However, De Villiers (1990) terms the process whereby students are able to activate their prior learning control as "metalearning". Put simply, students become aware of the strengths and weaknesses of their learning potential. The more students are aware of their learning difficulties (demands) and their own learning abilities (potential) the more they are able to match the task demands with their learning potential in enhancing their learning performance (De Villiers, 1990:39).

Nickerson *et al.* (1985:105-107) also refer to the need for students to allow their past "intellectual curiosity" or "desire to know" actively to inform their classroom behaviour. Matching a student's learning potential with task demands is a critical priority for "underprepared" learners' executive learning control. A student's inability to do so can indicate metacognitive cultural deprivation that contributes to an incapacity for anticipating academic task outcomes (De Villiers, 1990:39). Such outcome anticipation incapacity leads to a deep learning difficulty (Biggs and Rihn, 1984: 279; Parsons, 1993:24-32).

3.6.2 Epistemic equilibrium

Intellectual curiosity arousal or desire to know is often the first step in metacognitive stimulation. Feuerstein *et al.* (1980:90) identifies this function as having a reflective knowledge control function. He argues that the reflective nature of metacognition does not arise spontaneously but 'must be evoked by the disequilibrium inherent in a situation in which incompatibility exists between two or more sources of information' (Feuerstein *et al.*, 1980:90).

He also suggests that an epistemic disequilibrium between what is known (stored information) and the unknown (deficient information) in a student often arouses a desire to know (Feuerstein *et al.*, 1980:90). He uses the biblical analogy of Moses' curiosity of the spectacle of a fire that did not consume the bush to illustrate incompatibility between the stored and current information that produced a problem, which was experienced as a state of disequilibrium.

> ...and Moses said "I will turn aside now, and see this great sight, why the bush is not burnt (Exodus 3.3) (Feuerstein, 1980:90).

If such an epistemic disequilibrium is incorporated in "underprepared" students' metacognitive learning tasks it can plausibly disturb or alter the impairment pattern and structure (Feuerstein *et al.* 1980:90). Thus, an evocation of the "why" type of questions that are necessary for progression into the "how" type of metacognitive deep controlling questions can be set in motion (Biggs and Rihn, 1984:279).

Such an intervention can have a strong altering of deficient metacognitive thinking processes underlying the students' knowledge equilibrium (Feuerstein, 1980:90). It can also lead to stimulation of the "why'" and "how" questions that are necessary for

students' acquisition of critical executive control skills. Such questions would therefore be asked from a deep desire to know why, for example, industrial accidents occur (disequilibrium), and how they can be prevented (equilibration).

It is in the notion of a "concept mapping problem solving heuristics" that metacognitive underpreparedness surfaces frequently.

3.6.3 Concept maps and problem solving heuristics

Scott-Fogler (1995:17) conceptualises a successful use of problem solving heuristics or road map as an index of a learner's potential for dissecting a problem into its composite strands. The significance of Scott-Fogler's definition lies in its identification of successful task performance as a process of sequencing problem solving heuristics. Bereiter and Scardamalia (1985:70-73) conceive such heuristics as determined by "metamemory" or skills for retrieving information from long term to the short-term memory terminals

Kitchin and Freundschuh (2000:1), however, define this concept as concerned with 'how we think about space, and how those thoughts are reflected in human spatial behaviour.' Most "underprepared" students struggle to perceive both sides of an object or event. This is often related to the students' inadequate deployment of their descriptive capacity (Olson & Bialystok, 1983:8; Mehl, 1991). The objectal perception impairment has also been identified as a problem of conceptual "understanding" (Lazarus *et al.,* 1989:155). Without that understanding, those students often have an impaired capacity for anticipating an opposite viewpoint of their verbal or written argument.

Intervention may also require the use of technology-mediated classrooms (Lankshear and Knobel, 1997:164) and other computer-based learning tools for concept mapping potential reinforcement (Mehl, 1991:11-14). Information processing technologies such as "multimedia" tools can also be employed in altering "underprepared" students' "deficiency" in secondary data library gathering skills (Sharp, Olds, Miller and Dyrud, 1999:53-57). Since the concept mapping strategies are related to "thinking styles", the latter is examined next.

3.6.4 Thinking styles

Sternberg (1997:19) argues that learners need to be made aware of their preferred ways of thinking and the profiles of those thinking styles. That awareness is characterised as a "mental self-government" construct (Sternberg, 1997:19). He refers to it in this way because of its superior control over the lower (cognitive) thinking processes (Sternberg, 1979; Nickerson *et al.*, 1985). It is, as it were, the shepherd of transitory knowledge.

Such a hierachical notion of thinking styles improves thought processes without affecting content structures (Nickerson *et al.*, 1985:103). Once improved, those thinking styles have a potential for stimulating an "underprepared" student into a reflective coordination of his/her thinking structures (Feuerstein *et al.* 1980; Nickerson *et al.*, 1985; Sternberg, 1997).

Cilliers & Sternberg (2001:14) contends, however, that thinking styles are not only preferred and hierachised, but they also exemplify a student's differential way of using his/her intelligence (Cilliers *et al.*, 2001:14). Another thinking styles conception

has concentrated its efforts on reversing the SA disadvantaged children's passive thinking styles preference. It does this by stimulating their active thinking potential (Adams & Adams, 1991: 42-52). Thinking styles are also useful for matching the students' metacognitive skills with their chosen vocational opportunity (Osipow, 1973:9-10). The thinking styles will be explained below from the viewpoint of Sternberg's triarchic intelligence theory.

3.7 STERNBERG'S TRIARCHIC INTELLIGENCE MODEL

Perkins (1998:73) contends that "learning is a consequence of thinking." If this is the case, then what is the relationship between learning, thinking and intelligence? In answer to this question, Perkins (1998:67-68) proposes the notion of "learnable intelligence" which is practical and concerned with

1. Teaching the students how to behave more intelligently
2. Teaching for intelligence that can improve the students' academic achievements

This is what Sternberg's (1998:3) "triarchic theory of intelligence" seeks to achieve. It has a three-tier structure consisting of

1. Analytical abilities; the abilities to analyse, judge, evaluate, compare or contrast.
2. Creative abilities; the abilities used to create, invent, discover, imagine, or suppose
3. Practical abilities; the abilities used to apply, put into practice, implement, or use.

This theory emphasises integrating memory, analytical, creative and practical thinking "abilities" across the subject matter areas (Sternberg, 1998:3). Its usefulness

3.9 PRIOR LEARNING EXPERIENCE AND INDIGENOUS KNOWLEDGE SYSTEMS

The concept of "learning experience" or "experiential learning" is fundamental to the claims made by Engelbrecht (1992) and Kok, *et al.* (1996) that technikon education is an applied technology oriented education. However, that notion of applied education is usually limited to "cooperative education" which fails to "recognise prior learning" (RPL) experience as an accreditable[20] experiential knowledge.

Nevertheless, three "prior learning experience" definitions and their implications for recognising and accrediting the learners' "indigenous knowledge systems" as "prior learning experience" are considered next.

Andrade and Perkins (1998:72) affirm that

> [p]rior knowledge and experience in an area are excellent preparation for further learning, because they provide the learner with hooks on which to hang new knowledge (Andrade & Perkins, 1998:72).

This notion of experiential learning as prior knowledge is important because whatever new knowledge a learner acquires has to coexist with and be integrated into his/her prior knowledge.

As "underprepared" students also possess this type of prior knowledge, it can be surmised that this knowledge either collides or coexists tenuously with formally acquired scientific knowledge.

The second definition is presented by Beard & Wilson (2002:16) who contend that experiential learning contains 'the insight gained through the conscious or

[20] The specification of accreditation principles falls beyond the study's scope.

unconscious internalisation of our own or observed interactions, which build upon our past experiences and knowledge.' This definition emphasises the internalised interactive aspects of prior experienced knowledge.

The third definition by Evans (1992:66) goes beyond the above two by calling for a scientific assessment and accreditation of experiential learning. Evans (1992:67) also distinguishes between experiential learning and on-course or cooperative education. Whereas experiential learning refers to all untested knowledge and skills acquired by people during their life span (Evans, 1992: ix & 67), cooperative experiential education is often a compulsory technikon course requirement.

The most complex issue with regard to assessing prior learning experience is the fact that it is an uncertified form of knowledge. Evans (1992:67) argues, however, that this knowledge cannot be accredited unless it is assessed, it cannot be assessed unless it is identified, it cannot be identified without being systematically extracted and reflected upon. These assessment phases are all necessary in arguing for IKS accreditation as the students' prior experienced knowledge. It is necessary to consider the IKS scientific claims before a case is made for its accreditation and incorporation into technikon classroom pedagogy.

Emeagwali (2003:3) contends that African indigenous knowledge (AIK) is communitarian in nature and inclusive in its intellectual enterprise. It includes a broad spectrum of social life and scientific fields such as food technology, metallurgy, traditional medicine, microbiology, military science, etc. Among some of its principal cognitive/knowledge areas identified by Emeagwali (2003:3) are

- Some principles of African Traditional Medicine (ATM)
- Indigenous pharmacology
- Various numeration systems across the continent
- Indigenous games of strategy, puzzles etc
- Various types of fermented food products across the continent
- Indigenous techniques in producing alcoholic beverages
- The major research issues for micro-biologists, nutritionists and sociologists with respect to indigenous food processing
- The range of metal products developed in various African city states
- Indigenous innovations in steel making such as the hot air blast furnace
- Building principles incorporated in indigenous architecture

While it is contestable how much of this knowledge is available to African students, a critical challenge is to accredit and incorporate in curriculum and on-course any experiential learning the students' prior knowledge in the above and other IKS. That recognition can be grafted, for instance, into Engelbrecht's vocational task matrix.

The University of Stellenbosch's medical faculty has explored this possibility by, for example, conducting research on the African potato's properties for AIDS treatment. Most of the "underprepared" rural students have some knowledge of the medicinal properties of popularly used herbs such as the above-mentioned potato. If tapped into, those IKS can enrich the students' classroom development.

In the agricultural or nature conservation sciences, in particular, the students' prior learning experience can also mediate usefully their acquisition of vocational skills. The key issue lies in "recognizing this prior learning" (RPL) as scientific knowledge that uses community centred holistic methods of justifying its knowledge claims (Emeagwali, 2003:4).

Whereas it is necessary to bridge the "underprepared" students' school to technikon transition, there is also a need for cognitive bridging between, for example, the linear

structures of mainstream scientific knowledge practice and those of cyclical or repetitive IKS (Goduka, 1999). Even the course design_concepts such as "three dimensionality" can also be examined comparatively against, for example, the IKS' notion of "spatial cyclicality" (Kunene, 1981:xi).

Technikon experiential learning "course portfolios" can include this type of knowledge in its course requirements and accreditation processes (Blackman and Brown, 1992:109). This was done successfully in Britain where, for example, an RPL study reported an incorporation of the housewife neighbourhood women's family care skills in developing their vocational learning potentials (Webb, 1992:100).

It would be worth exploring the extent to which IKS can also be used effectively in modifying the Feuerstein cultural deprivation syndrome in "underprepared" students. By not tapping into the latter's IKS repertoire, formal scientific instruction could fail to provide instrumental mediation for the students' self-management ability and hooks of vocational proficiency skills.

3.10 CONCLUSION

The Chapter investigated the ways and means of identifying and reversing academic underpreparedness. It seems that L2 English acquisition constitutes linguistic and cultural empowerment for the "underprepared" rural and township students. It was also suggested, along Cummins's lines, that such an empowerment can be facilitated through a positive L1 oral transfer in, for example, class project presentations. Engelbrecht's vocational task matrix was used in steering the discussion toward the necessity for defining SLA technically.

Feuerstein's MLE and FIE were also examined in the light of modifying the impaired students' cognitive substructures. The metacognitive section considered concepts such as task effort, strategy and planning as critical academic competency capacity stimulators. Such stimulation could lead to the attainment of academic abilities that indicate vocational preparedness. Sternberg's triarchic intelligence model was seen as a useful stimulator of the impaired students' thinking skills and styles.

Finally, the discussion suggested that the concept of experiential learning should be used as a basis for accrediting and incorporating rural and township students' IKS into technikon curricula. The latter can mediate the students' scientific concept acquisition and reverse their 'deprivation' of prior knowledge skills in classrooms and vocational or job related skills proficiency assessments. It can also be used in informing course design and cooperative industry education training where, for instance, the students'/trainees' prior knowledge skills in, say wild life tracking, can be used as a basis for developing their environmental conservation and/or game park scientific course concepts. Most of the IKS lies untapped in the cognitive structure of "underprepared" students and it can be unlocked through, for example, expert lecturer mediation.

CHAPTER 4

UNDERPREPAREDNESS FROM A DESCRIPTIVE SURVEY VIEWPOINT

4.1 INTRODUCTION

Firstly, this chapter considers the research design factors including the study's population *universum*, sampling techniques and research methodology. Secondly, the frequency distributions of selected quantitative data from a 34 item questionnaire on "student learning" are presented to indicate the observed frequency (f_o) and expected frequency (f_e) distributions. The latter was done in accordance with four categories: all technikons; Technikons 1, 3 & 5 (disadvantaged technikons); bipolar Technikons 2 & 4 (advantaged technikons) and gender distributions. The data were analysed in terms of the six dependent variables in the questionnaire: personal information (PI), family background (FB), high school learning experience (HSLE), technikon learning experience (TLE), language and communication (LC) and learning support (LS). The data scores are presented in the form of tables and histograms with raw data that is interpreted to determine the frequency distributions of independent variables (Babbie & Mouton, 2001:422). Thirdly, the results of data gathered through semi-tructured staff interviews are discussed.

4. 2 RESEARCH DESIGN

Leedy (1993:185) contends that in a research survey the nature of the data determines the research methodology. However, Babbie & Mouton (2001: xxvi)

contend that there is a necessity to distinguish between "research design" and "research methodology":

> Research design is a plan or structured framework of how you intend conducting the research in order to solve the research problem. Research methodology refers to the methods, techniques, and procedures that are employed in the process of implementing the research design or plan.

Both the first and second hypotheses will guide the empirical research as they constitute the points of reference in this Chapter.

These hypotheses are restated below:

The first hypothesis:

> The first hypothesis is that the impaired second language (L2) English and scientific or cognitive conceptual skills account for a large proportion of SAU impairment.

The second hypothesis:

> The second hypothesis is that the SA technikons selected for this study have formulated various responses to SAU. Each of these responses reflect the technikons' concern with the challenges posed of SAU to vocational curricula.

Whereas the first hypothesis focuses on second language and cognitive skills impairments, the second hypothesis is concerned with institutional SAU responses.

The next design level specifies the research population and unit of analysis, sampling and procedural survey aspects.

4.3 RESEARCH POPULATION

Lynch & Huntsberger (1976:244) define the research population as the totality of a universe with common characteristics. This concept of a universe refers to a totality of people with shared characteristics. It also refers to measurement attributes. Walizer & Wienir (1978:268) associate the research population with a group of people to which the survey pertains. The choice of a group to be studied is determined by the researcher's theory or practical interest in a study (Walizer, *et al.* 1978:268). This theory is also termed a search-inference framework or way of identifying the basic elements in a thinking or selection process (Jonathan, 2000:5).

The population characteristics, sample determination and sizing are explored below.

4.3.1 Population totality

Although financial, geo-institutional distances and time factors influenced the research population determination, the first year students and staff were generally chosen in collaboration with the research contact personnel at the technikons.

Five technikons comprised the population of the study. Three were historically disadvantaged institutions (HDIs): the Eastern Cape Technikon, Border Technikon (both in the Eastern Cape region) and the Peninsula Technikon (Western Cape). Two were historically advantaged institutions (HAIs): Cape Technikon (Western

Cape) and the then Natal Technikon (KwaZulu Natal). These institutions were labeled this way at the time of the survey in 2000 and some still use these labels.[21]

The resulting population *universum N (N* = population totality) is illustrated in Table 1 below.

Table 1: Collated population from all five technikons in the year 2000

Faculties	Bridging/Foundation students	First Year Students	Totals
Built environment & design	150	1000	1150
Engineering	200	1200	1400
Humanities	700	4300	5300
Life sciences	278	650	928
			8778

The above figure presents the tallies of students registered in the bridging/foundation, first year and other study levels.

Some technikons had accurate separate records of their bridging and first year tallies, and others had a combined single category of first years that included the bridging/foundation student cohort. This made it impossible to present the technikon figures individually. Therefore, the above *universum* is an aggregation of the first year demographic trends for all five technikons in the year 2000.

[21] In terms of the National Higher Education Plan (Ministry of Education, 2001) the Natal Technikon has merged with ML Sultan Technikon ot form the Durban Institute of Technology. The other technikons in the study population are also due to merge.

4.3.2 Sampling

Walizer, *et al.* (1978:426) caution that it is common that because of financial, time and other constraints the construction of a research sample necessitates the selection of a small "measurement unit" from a large population universe. Thus, although there are approximately 12 technikons in SA, the selection of five technikons represents a "unit of analysis" which complies with the measurement criteria for sample selection (Walizer, *et al.* 1978:426).

Walizer, *et al.* (1978:430) use the concept "unit of measurement" in describing an extrapolated microcosmic population. However, Babbie & Mouton (2001:85-86) use the term "unit of analysis" or "aggregate groups" in reference to the same microcosmic population element. Clearly, both these concepts refer to the smallest selected sample unit/s.

In relation to sample size (denoted by *S*), Leedy (1989:205) states that the "'[s]ample size depends largely on the degree to which the sample population approximates the qualities and characteristics of the general population." Walizer *et al.* (1978:430) are of the view that an important question regarding sample size is whether a particular construction allows all population elements an equal chance of selection.

To facilitate that equal chance, it was decided that a combination of "convenience" (Leedy, 1993:200) and "quota sampling" (Lynch & Huntsberger, 1976:250) techniques was the best procedure to follow. As can be seen in Chapter 6, this may be considered to be a limitation.

4.3.2.1 Convenience and quota sampling procedures

The combined use of convenience (Leedy, 1993:200) and quota sampling procedures was motivated by the prohibitiveness of research costs and time constraints.

Convenience sampling targeted the technikons in the Eastern and Western Cape and KwaZulu Natal because they were nearer to the researcher. Quota sampling targeted all first year students registered in the humanities and commerce disciplines at the abovementioned technikons in the year 2000. Quota sampling also specified the inclusion of "disadvantaged" or rural and township female and male first year students.

Only the students from pre-first year or bridging classes in the engineering and science disciplines were admissible to the selection process. The inclusion of those "bridging" or "foundation" students was borne by the fact that such courses often incorporate the language, communication and cognitive development aspects (Kotecha, 1994). Sampling was therefore triangulated through the use of both techniques (Leedy, 1989:143).

The sample was sized according to the following sample representativeness formula.

$$\mathbf{n\ (n\ for\ sample\ size) = (z/e)^2\ (p)\ (1\text{-}p)}$$

And the combination of the probability and quota selection procedures resulted in the total sample being *n = 478*. And the clustering around the true value for probability was fixed at .05% using the measure of sampling error

$$S = 0.05$$

At the very least the study would strive for an absolute $S = 0.01$ margin of error as recommended by Babbie *et al.* (2001:180).

Some adjustments had to be made to accommodate the typical institutional demographic and classroom variances. The factors influencing the variation of sample composition were, among others, the mono-racial demographics at HDIs and the multiracial demographics at HAIs. The selection was more complicated in the case of the two HAIs, i.e., Cape and Natal Technikons, since race was not a variable in the study.

These selection processes sought to eliminate or bring under control the advent of sampling bias. The cooperative working relation between the researcher and the institutional contact persons ensured the minimisation of that bias. This was done by ensuring that few non-first year students became part of the sample. The notion of bias control is discussed further below as part of the research method issues.

4.4 METHODOLOGY

Creswell (1994:174-175) maintains that qualitative and quantitative methods and designs can be combined in a single study as a means of triangulation. Creswell (1994:177) also proposes different models of combined designs including what he

refers to as the " dominant-less-dominant design ". He argues that "in this design the researcher presents the study within a single dominant paradigm with one small component of the overall study drawn from the alternative paradigm". In this case the dominant methodology was quantitative and was employed in designing and processing the findings of the student questionnaire. The less dominant methodology was qualitative, relating to the semi-structured interview of staff members. According to Creswell (1994:174) triangulation refers to the use of a variety of methods used to improve the validity of the research. He states that one assumption of triangulation is that bias inherent in data sources, the researcher and the methods used to gather and analyse information, will be eliminated when a variety of methods is used. Another assumption is that "triangulation of results will provide convergence about the "truth" of some social phenomenon" Creswell (1994:174).

4.4.1 Questionnaire design

Leedy (1989:189) maintains that a questionnaire needs to be readily understandable. Bearing in mind that English is a second language for the respondents, an attempt was made to present the questions in plain English. Although this was not determined through rigorous and systematic testing, it could, however, be inferred that this had been successfully monitored in the pilot testing of "bridging" course Communication Skills, KOT1 EZ students in the electrical engineering faculty at the Cape Technikon.

Most of the pilot participants were from rural and township schools and thus it was possible to use their inputs in adjusting the language level. Where, for example, those participants kept asking for clarification of a particular item concept during

testing, that concept was reviewed and adjusted during post pilot questionnaire redesigning. The revision of the whole questionnaire was done after advice from the language and questionnaire designing experts. The_instrument had a total of thirty five question items. Thirty of them were closed type questions and the rest were open-ended (see Appendix B).

Most of the closed questions were scaled along the Likert Scale design. Some of them, however, had three options instead of the traditional 5 option Likert Scale model. This adjustment was made to reduce monotony in question structuring and to ensure that the options were real ones. Some were cross-referencing questions to check against the non-response or the conflicting responses. For quantitative analysis, the open-ended questions were structured with a view to clustering the responses into bandwidth units.

As mentioned in the introduction to this Chapter, the questionnaire had six categories: general information (GI), family background (FB), high school learning experience (HSLE), technikon learning experience (TLE), language and communication (LC) and learning support (LS) categories. Each of these categories will be explored fully later in this discussion.

4.4.2 Research cooperation

Permission to gather data was requested at least three months before the actual visits and/or mailing of the data gathering instruments. A transmittal letter, as suggested by Leedy (1989:190), was sent to all directors and/or coordinators of research development units at the technikons in SA (see Appendix A). A follow up,

in the form of email and telephone clarification of the study's objectives, preceded the mailing of the specimen questionnaires and institutional visits.

In the case of Natal Technikon, logistical difficulties necessitated the surface mailing of the batch of questionnaires. Therefore there was no face-to-face contact with Natal Technikon personnel. The interview sheet containing the questions and time allocations was also emailed (see Appendix D). The lack of cooperation on the part of other technikons inevitably meant the reduction of the sample size.

4.5 DATA ANALYSIS

4.5.1 Preliminary procedural aspects

It soon became clear that reporting on all analysed data would not be feasible. The reported results for the selected cases depict the kinds of analytical operations and procedures that were performed on the data. The data analysis begins with a treatment of the closed questions that is followed by a discussion of the open-ended questions. As regards the questionnaire format, the data are explored in terms of the six outlined categories. A computer coded data score spreadsheet (see Appendix C), as suggested by Babbie, *et al.* (2001:415), was used in coding the questionnaire responses.

4.5.1.1 Respondents' profiling

There was only one free-standing question item, i.e. the general information (GI) category. The GI profiles the respondents in terms of "faculty or discipline", "year of

study" and "gender" attributes. Although 80% of the items were analysed, only a select few of them will be reported for reasons of data analysis control.

4.5.1.2 Statistical procedures

Both univariate and bivariate descriptive statistical operations were used in treating the grouped closed questions. Although the descriptive statistical procedure is considered marginal and nominal in its data reporting (Babbie, *et al.* 2001:423 and Leedy, 1989:37), such a combination was thought useful in the light of the nature of the data. The rule of data analysis, i.e., the data determine the interpretation procedures, was applied in selecting the analytical procedures (Leedy, 1989:249).
Only the expected frequency (f_e) distributions, the observed frequency (f_o) distributions, the degrees of freedom (df) between the variables and the null hypothesis (H_o) were determined through contingency tables (Fergusson, 1981:207-211 and Kenett & Zachs, 1998:285-286). The histogram percentile bar data representations are also provided.

The reason for using both the contingency tables and histogrammatic analysis was to employ the probability theory in testing for (1) independence between the study's nominal variables of the f_e and f_o comparisons, (2) application of the test of significance and proportional differentiation in the form of a Chi-Square (x^2) statistic using the formula:

$$X^2 = \frac{(O - E)^2}{E}$$

and to determine the *df* associated with the value of x^2 (Ferguson, 1981:201). The above formula "tells us to subtract E from O, square the difference, and divide by E. We do this formula for each group separately, and then add them together" (Furlong, Lovelace, Lovelace, 2000: 411)".

4.5.1.3 Statistical significance

The value of x^2 required for significance was fixed at the 0.05 level or at most in the 0.01 for *df* =1 in determining the proportionality of variable independence (Ferguson, 1981:208).

The categorical f_e and f_o scores are used in comparing the respondents' second language and cognitive school and technikon learning experiences. That comparison will signify the emerging pattern for the technikons' SAU responses. Such comparisons should also indicate the distribution between the L2, cognitive and metacognitive variables and the various dependent variables.

The data were grouped into four coded categories:

(1) all technikons
(2) disadvantaged against advantaged technikons
(3) Technikons 1, 3 and 5
(4) Bipolar, Technikons 2 & 4
(5) Gender

It is only from the perspective of groups 1, 3, 4 & 5 that the data will be examined here as category (2) yielded inadequate results for analytical operation. In addition to these procedures the histograms also present graphically the class intervals on rectangular bars, especially for the study's open-ended items (Lynch & Huntsberger. 1976:22). The closed questions are discussed in the next section.

4.6 CLOSED QUESTIONS

The results for the closed items are discussed through the perspective of the six dependent variables, i.e., general information (GI), family background (FB), high school learning experience (HSLE), technikon learning experience (TLE), language and communication (LC) and learning support (LS). Only the highest and lowest tabulated categorical column (C), row (R) scores and percentages of the f_o and f_e are considered.

The tables that highlight the relevant key f_o marginal values are reported first and compared with the f_e marginals. Where the difference is negligible, only the f_o values are reported. The histograms will be used sparingly for graphic results amplification. Every attempt will be made to simplify the language of statistical reporting, but the dreary nature of quantitative facts is unchangeable.

4.6.1 General information

The GI dependent variable requested the respondents to furnish particulars concerning the "name of their technikon", their "faculty", their "year of study" and "gender". As mentioned earlier, the GI variable profiles the respondents. The responses were tabulated to describe the f_e and f_o GI frequency distributions. Instead of indicating their faculty as requested, 85% of the respondents gave information on their "discipline". This was accepted as an indication of their study field.

Code	Discipline
1.	Business informatics
2.	Business science, taxation and auditing
3.	Civil engineering
4.	Design: Access course
5.	Education: General & science
6.	Engineering: Electrical and maritime studies
7.	Fine art
8.	Human resources management
9.	Life science, dental technology and somatology
10.	Technology
11.	Tertiary foundation course

Figure 4.1: Technikon disciplines in the sample

Six of these eleven disciplines were selected for detailed analysis in terms of the study's focus on the L2 and cognitive and metacognitive SAU sub-variables. The rationale for that selection was that most of these disciplines were found to exist across the 5 technikon sample. All the 11 disciplines are listed here for reasons of technical detail, but only the first six of them were analysed. Table 2 reports on the f_o scores for the disciplines.

Table 2: Six study disciplines from all technikons

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	Discipline	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
Count	1	0	84	0	0	0	84
Column Percent		0.00%	37.50%	0.00%	0.00%	0.00%	
Count	2	1	0	44	49	43	137
Column Percent		1.72%	0.00%	81.48%	67.12%	62.32%	
Count	3	0	3	0	0	0	3
Column Percent		0.00%	1.34%	0.00%	0.00%	0.00%	
Count	4	0	49	0	0	19	68
Column Percent		0.00%	21.88%	0.00%	0.00%	27.54%	
Count	5	0	23	0	0	0	23
Column Percent		0.00%	10.27%	0.00%	0.00%	0.00%	
Count	6	1	31	0	1	0	33
Column Percent		1.72%	13.84%	0.00%	1.37%	0.00%	
Count	7	11	0	0	0	0	11
Column Percent		18.97%	0.00%	0.00%	0.00%	0.00%	
Count	8	22	6	0	0	0	28
Column Percent		37.93%	2.68%	0.00%	0.00%	0.00%	
Count	9	2	28	0	23	7	60
Column Percent		3.45%	12.50%	0.00%	31.51%	10.14%	
Count	10	2	0	10	0	0	12
Column Percent		3.45%	0.00%	18.52%	0.00%	0.00%	
Count	11	19	0	0	0	0	19
Column Percent		32.76%	0.00%	0.00%	0.00%	0.00%	
Count	All Grps	58	224	54	73	69	478

A vertical column reading of the table shows that of the first six disciplines across all five technikons, discipline 1, business science, taxation and auditing had the highest observed frequency or f_o of 137 cases. A horizontal reading of the table shows that Technikon 3 had the highest score of 81.48% in this subject.

The f_e marginals in Table 2 also show similar distribution intervals across the 11 disciplines.

Table3: Frequency distributions for the disciplines

Summary Table: Expected Frequencies Marked cells have counts > 10 Pearson Chi-square: 825.625, df=40, p=0.00000						
Discipline	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
1	10.19247	39.3640	9.48954	12.82845	12.12552	84.0000
2	16.62343	64.2008	15.47699	20.92259	19.77615	137.0000
3	0.36402	1.4059	0.33891	0.45816	0.43305	3.0000
4	8.25105	31.8661	7.68201	10.38494	9.81590	68.0000
5	2.79079	10.7782	2.59833	3.51255	3.32008	23.0000
6	4.00418	15.4644	3.72803	5.03975	4.76360	33.0000
7	1.33473	5.1548	1.24268	1.67992	1.58787	11.0000
8	3.39749	13.1213	3.16318	4.27615	4.04184	28.0000
9	7.28033	28.1172	6.77824	9.16318	8.66109	60.0000
10	1.45607	5.6234	1.35565	1.83264	1.73222	12.0000
11	2.30544	8.9038	2.14644	2.90167	2.74268	19.0000
All Grps	58.00000	224.0000	54.00000	73.00000	69.00000	478.0000

The expected frequency (f_e) and row totals for all the 11 disciplines even out with those of the f_o marginals. Discipline 2 in the second row still has a higher f_e score of 137. The x^2 of 825 and the H_o of p=0.00000 show no significant dependence between the observed and expected frequencies. The null hypothesis, namely that there is no specific association between the study discipline and underpreparedness, holds true. This was also confirmed by the *df* = 40 which is higher than that fixed at the significance level of p=0.01.

The above results can also be seen more readily in the percentile bars of Figure 4.2 below. Each of the histograms in this chapter will have a scaled left vertical grid that captures the number of observations, and the horizontal top caption that reads "histogram" or "histogram students". The bottom horizontal grid represents the item number and variable under consideration.

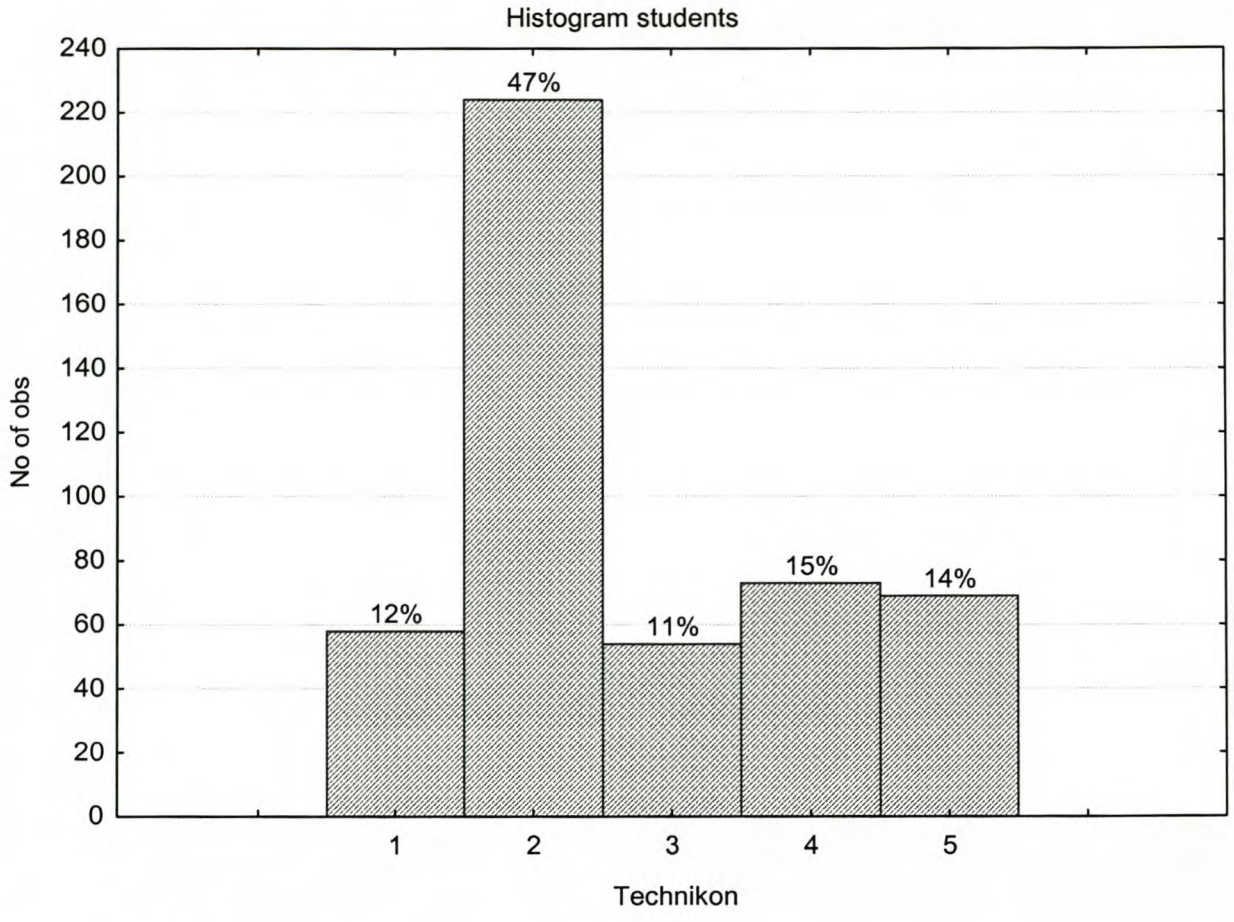

Figure 4.2: Technikon disciplines

The second bar shows Technikon 2 as having the highest score of 47% for discipline 2. However, this score has to be read in the light of the tabulated distributions.

The f_e values for the "year" of registration, as shown in Table 3 below, show that the highest row subtotal of 433 respondents were first years at the five technikons. Only 45_respondents were drawn from other levels of study. The 90.5% sample size first year proportion was significant for respondent filtering and control.

Table 4: Expected frequency distribution for the year of study

Summary Table: Expected Frequencies Marked cells have counts > 10 Pearson Chi-square: 90.5461, df=8, p=.000000						
Year	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
1	52.53975	202.9121	48.91632	66.12762	62.50418	433.0000
2	3.51883	13.5900	3.27615	4.42887	4.18619	29.0000
3	1.94142	7.4979	1.80753	2.44351	2.30962	16.0000
All Grps	58.00000	224.0000	54.00000	73.00000	69.00000	478.0000

Column 2 of Table 4 shows that a high f_e of 202 for first year respondents at Technikon 2. That score is followed by Technikon 5 which had a f_e of 66. The df = 8 indicated that there was a significant difference in the distribution of first year respondents across the sample. The x^2 of 90.5 meant that there is no significant association between first year study level and a technikon. This was also confirmed by the null hypothesis.

The question relating to the family background (FB) variable asked the respondents "What kind of work does the breadwinner in your family do?" It was assumed that the breadwinner is the respondent's first line technikon study sponsor.

4.6.2 Family background

There were five attributes in this item and these are

(1) Works in factory
(2) Has a professional job
(3) Is self-employed
(4) Is unemployed
(5) other

The highest f_o score of 196 or 42% in Table 5 below indicates that the respondents' breadwinners hold some form of profession or other job.[22]

Table 5: Observed frequencies for breadwinner's job

	Summary Frequency Table (studentsXXa.sta) Marked cells have counts > 10 (Marginal summaries are not marked)						
	Technikon	5 Work 1	5 Work 2	5 Work 3	5 Work 4	5 Work 5	Row Totals
Count	1	9	31	5	3	7	55
Column Percent		13.85%	15.82%	6.33%	6.25%	8.97%	
Count	2	21	101	52	11	35	220
Column Percent		32.31%	51.53%	65.82%	22.92%	44.87%	
Count	3	5	22	7	13	4	51
Column Percent		7.69%	11.22%	8.86%	27.08%	5.13%	
Count	4	10	27	11	12	12	72
Column Percent		15.38%	13.78%	13.92%	25.00%	15.38%	
Count	5	20	15	4	9	20	68
Column Percent		30.77%	7.65%	5.06%	18.75%	25.64%	
Count	All Grps	65	196	79	48	78	466

There was an x^2 of 70.6% which confirmed the significance of the breadwinner's professional job being proportionally different from any other job attribute in this item.

4.6.3 High school learning experience

Item 8 of this high school learning experience (HSLE) category asked the respondents to say "Which one of the following persons helped you the most with your high school studies?" The variable had six helper attributes: mother, father, brother, sister, friend and other.

[22] I would like to caution against a literal acceptance of these figures as some respondents may have misunderstood the term "profession".

The mother-helper attribute had an observed frequency or f_o score of 195 or 45.5% out of the R total of 476. The x^2 of 35.71 showed no dependence between the mother-helper and the respondents' HSLE.

Item 9 asked "How often did your teachers at high school use English as a medium of instruction (teaching of language subjects excluded)?" It had five attributes and their corresponding values:

Always = 1
Usually = 2
Fairly often = 3
Only occasionally = 4
Never = 5

The results are interpreted using both the highest and the lowest scores. The highest f_o score of row 3 = 234 or 49% shows the "fairly often" attribute for school English instruction with a high score in comparison with the "always" attribute. Table 5 illustrates the distribution.

Table 6: The observed frequencies for understanding English in the classroom

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	9 English	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
Count	1	23	28	24	2	1	78
Column Percent		40.35%	12.50%	44.44%	2.74%	1.45%	
Count	2	12	54	18	22	36	142
Column Percent		21.05%	24.11%	33.33%	30.14%	52.17%	
Count	3	14	135	5	49	31	234
Column Percent		24.56%	60.27%	9.26%	67.12%	44.93%	
Count	4	8	7	7	0	1	23
Column Percent		14.04%	3.13%	12.96%	0.00%	1.45%	
Count	All Grps	57	224	54	73	69	477

Table 6 shows the observed frequencies for respondents' understanding of English when it is used as a medium of instruction in the classroom. Because of a 100% non-response rate for attribute 5 (never), this was subsumed in attribute 4 (only occasionally) which had 24 cases. The latter is important for SAU specification. The expected frequency or f_e scores for the same attribute showed no significant difference between itself and the above f_o distributions. The H_o stating that there is no significant association between the respondents' school English and the HSLE was rejected at p.0.00000.

Table 7: Expected frequency distribution for English

Summary Table: Expected Frequencies Marked cells have counts > 10 Pearson Chi-square: 140.733, df=12, p=0.00000						
9 English	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
1	9.32075	36.6289	8.83019	11.93711	11.28302	78.0000
2	16.96855	66.6834	16.07547	21.73166	20.54088	142.0000
3	27.96226	109.8868	26.49057	35.81132	33.84906	234.0000
4	2.74843	10.8008	2.60377	3.51992	3.32704	23.0000
All Grps	57.00000	224.0000	54.00000	73.00000	69.00000	477.0000

Item 9.1 was checked item 9 responses by enquiring "How well did you understand your teacher when he/she used English as a medium of instruction?"

The item's key concepts are "English" and "understanding". The subattributes were Never = 1, Sometimes = 2, Very well = 3 and Other = 4. There was a high f_e score of 142 that was concentrated around the mid point "sometimes" option. This score does not show a major difference with the f_o of 115 or 27% for attribute 3. Babbie *et al.* (2001:428-429) advise that the best procedure for handling the "no" response and borderline cases is to collapse them into single categories on both sides of the neutral median point. Thus subattributes 1 & 2 would be collapsed to give a score of

220, and subattributes 3 & 4 would be collapsed to give a figure of 257. This means that 257 respondents understood very well when the teacher used English as a medium of instruction.

These results can also be viewed more readily in histogram form in figure 4.3 below.

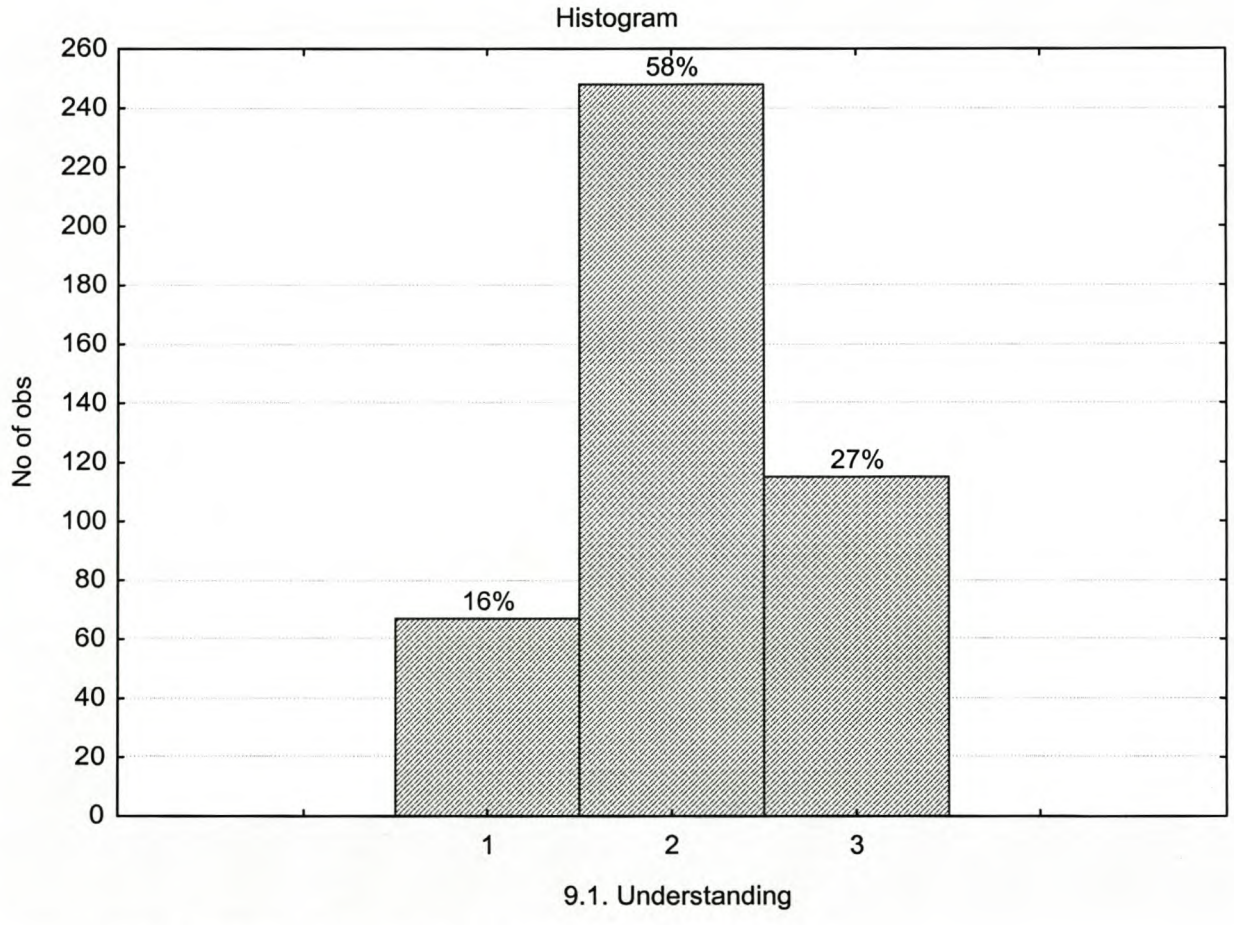

Figure 4.3: Understanding English as a school medium

The 16% that "never" understood the teacher's use of the English instruction medium would generally indicate major HSLE difficulties in the area of instructional comprehension. The latter is also an important indicator of future technikon English L2 challenges.

The null hypothesis or H_o which states that the "underprepared" students did not understand classroom English at the HSLE level is accepted at p=.000000.

Item 12 asked the respondents "On a scale of 1 to 5, how do you rate your HSLE in terms of each of the following sets of attributes?"

(a)	Boring	1 – 5	Exciting
(b)	Demanding	1 – 5	Easy
(c)	Unpleasant	1 – 5	Pleasant

The fe horizontal R score of 175 or 36.7% for the respondents who found the HSLE neither demanding nor boring was collapsed into the other rows to give 38 and 44 scores for the first and two second rows. The addition of these two rows gave an fe of 38 + 44 = 82 and 109 + 63 = 172 which meant that 172 of the respondents found TLE easy. This response may have been misleading given the fact that the majority of the respondents in the sample were, on the basis of lecturer selection, "underprepared" for technikon study. The figures are shown in Table 8 below.

Table 8: Expected frequencies for technikon learning experience

Summary Table: Expected Frequencies (studentsXXa.sta)
Marked cells have counts > 10
Pearson Chi-square: 52.5326, df=20, p=.000095

Technikon	12 Demanding 1	12 Demanding 2	12 Demanding 3	12 Demanding 4	12 Demanding 5	12 Demanding 6	Row Totals
1	4.61088	5.33891	21.2343	13.2259	7.64435	5.94561	58.000
2	17.80753	20.61925	82.0084	51.0795	29.52301	22.96234	224.000
3	4.29289	4.97071	19.7699	12.3138	7.11715	5.53556	54.000
4	5.80335	6.71967	26.7259	16.6464	9.62134	7.48326	73.000
5	5.48536	6.35146	25.2615	15.7343	9.09414	7.07322	69.000
All Grps	38.00000	44.00000	175.0000	109.0000	63.00000	49.00000	478.000

Item 14 enquired about the senior certificate symbol by asking the respondents "Did you obtain a matriculation exemption[23] at school?" The exemption guarantees a stronger probability for technikon admission than, for example, a senior certificate pass[18] (Frost, 1989:33). The respondents were asked to choose a "yes" or "no" option. Table 9 shows the f_o frequency distribution in this item.

Table 9: Observed frequency distribution for matric exemption

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	14 Matric exemption	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
Count	1	8	120	24	38	18	208
Column Percent		14.04%	60.00%	48.00%	52.05%	26.47%	
Count	2	49	80	26	35	50	240
Column Percent		85.96%	40.00%	52.00%	47.95%	73.53%	
Count	All Grps	57	200	50	73	68	448

The majority of respondents in the second row (Table 9) had a 240 or 53.5% total score that indicated not having obtained a matriculation exemption. There is a difference of 32 cases between Row 1 and Row 2 total scores. Even the x^2 of 50.7264 attests to an insignificant association between matriculation exemption and the HSLE. The next part reports on the results for the technikon learning experience (TLE) dependent variable.

4.6.4 Technikon learning experience

Item 15 is a Likert Scale item which asked the respondents "On a scale of 1 to 5, to which extent is each of the following descriptive of your learning experience at

[23] Exemption was the term which was still used at the time of the survey in 2000. A new term "endorsement" is now being used for matriculation with a higher education eligibility certification.

technikon?" The histogram below reports only the results of item 15c which asked the respondents "Do you struggle to cope with technikon learning experiences?".

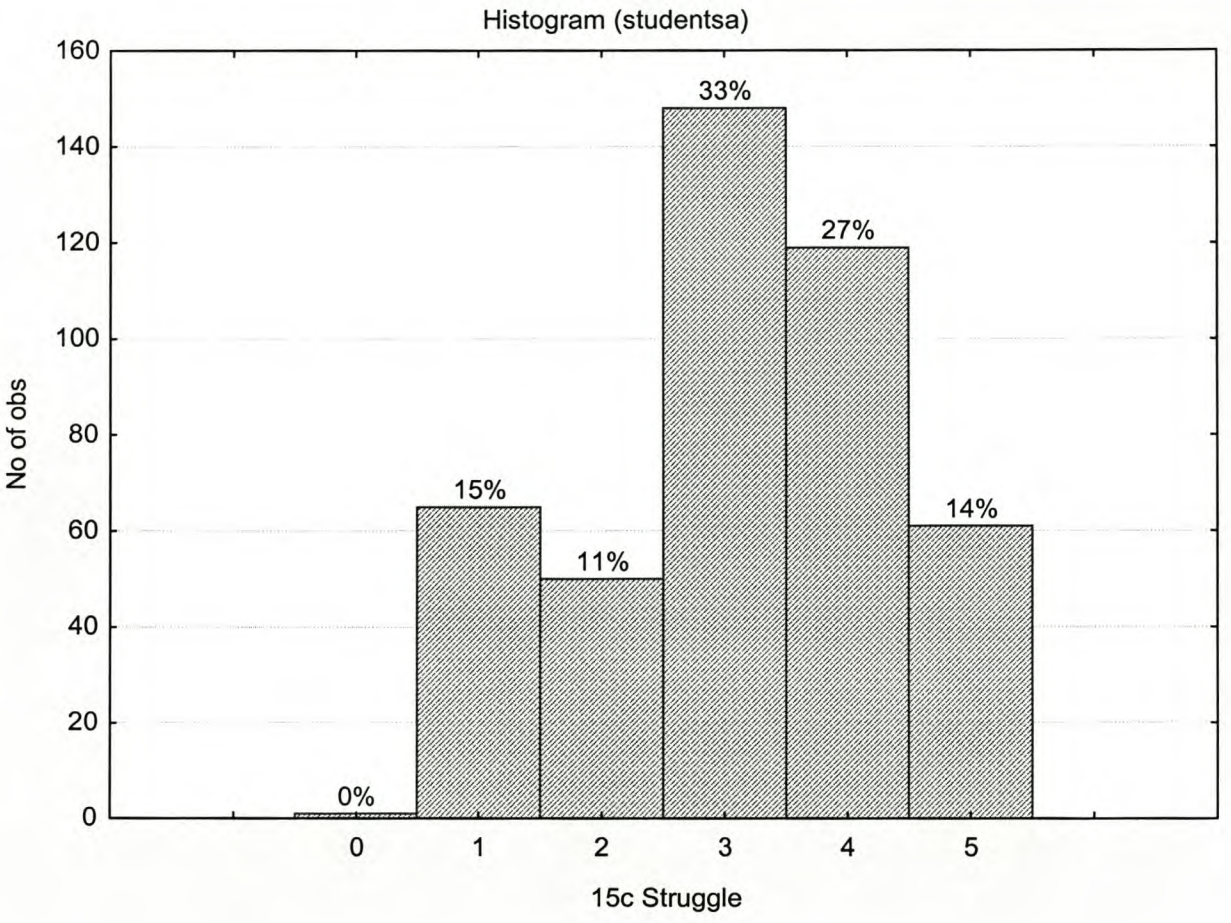

Figure 4.4: Descriptions of technikon learning experience

Again, bars 1 and 2 will be collapsed together to give a score of 26% for the respondents who struggle to catch up with the TLE. Bars 4 and 5 are also combined to give a score of 41% for catching up quickly. Clearly, more respondents thought they catch up quickly during classroom learning.

Item 16 was also a Likert Scale item which asked the respondents "If you are given academic homework, how do you go about doing it?" The attributes and values for this item are restated in full:

(a) No systematic plan 1–5 Use systematic plan
(b) Do it alone 1–5 Do it in a group
(c) Use minimum effort 1–5 Do it to the best of your ability

The value 1 was a negative option, 5 was positive or affirmative and 3 was a neutral option. Only the attributes 16(a) and 16(c) will be reported on. Attribute 16(a) is reported first in Table 10 below.

Table 10: Observed frequency for planning

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	16a Plan	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
Count	1	9	26	2	9	7	53
Column Percent		20.45%	12.09%	4.26%	13.64%	12.07%	
Count	2	4	30	5	6	2	47
Column Percent		9.09%	13.95%	10.64%	9.09%	3.45%	
Count	3	13	49	19	16	12	109
Column Percent		29.55%	22.79%	40.43%	24.24%	20.69%	
Count	4	8	67	6	19	13	113
Column Percent		18.18%	31.16%	12.77%	28.79%	22.41%	
Count	5	10	43	15	16	24	108
Column Percent		22.73%	20.00%	31.91%	24.24%	41.38%	
Count	All Grps	44	215	47	66	58	430

Rows 1, 2 and 3 will be collapsed to make a composite f_o score of 209 or 49% for the no systematic plan attribute. The same will be done with the "use a systematic plan" sub-attribute which gives a score of 221 or 51%.

With regard to 16(c) only the following item will be considered:

(c) Minimum effort 1– 5 Do it to the best of your ability

The highest f_o score of 206 or 47% for attribute 5 "Do it to the best of my ability" indicates in Table 9 that the respondents do their home work according to the best of their ability.

Table 11: Frequency distributions for minimum effort

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	16c Minimum effort	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
Count	1	4	49	1	3	3	60
Column Percent		8.33%	23.00%	2.08%	4.41%	4.62%	
Count	2	3	12	2	4	2	23
Column Percent		6.25%	5.63%	4.17%	5.88%	3.08%	
Count	3	4	25	10	6	8	53
Column Percent		8.33%	11.74%	20.83%	8.82%	12.31%	
Count	4	7	60	9	14	10	100
Column Percent		14.58%	28.17%	18.75%	20.59%	15.38%	

There was no significant difference between the f_e and f_o scores. This was also attested by a x^2 of 59.9487. The H_o of p=.000001 was indicated as rejecting the null hypothesis that doing the academic homework to the best of the respondent's ability is not associated with the TLE.

The above item 16c results can also be examined from the percentile angle of the histogram.

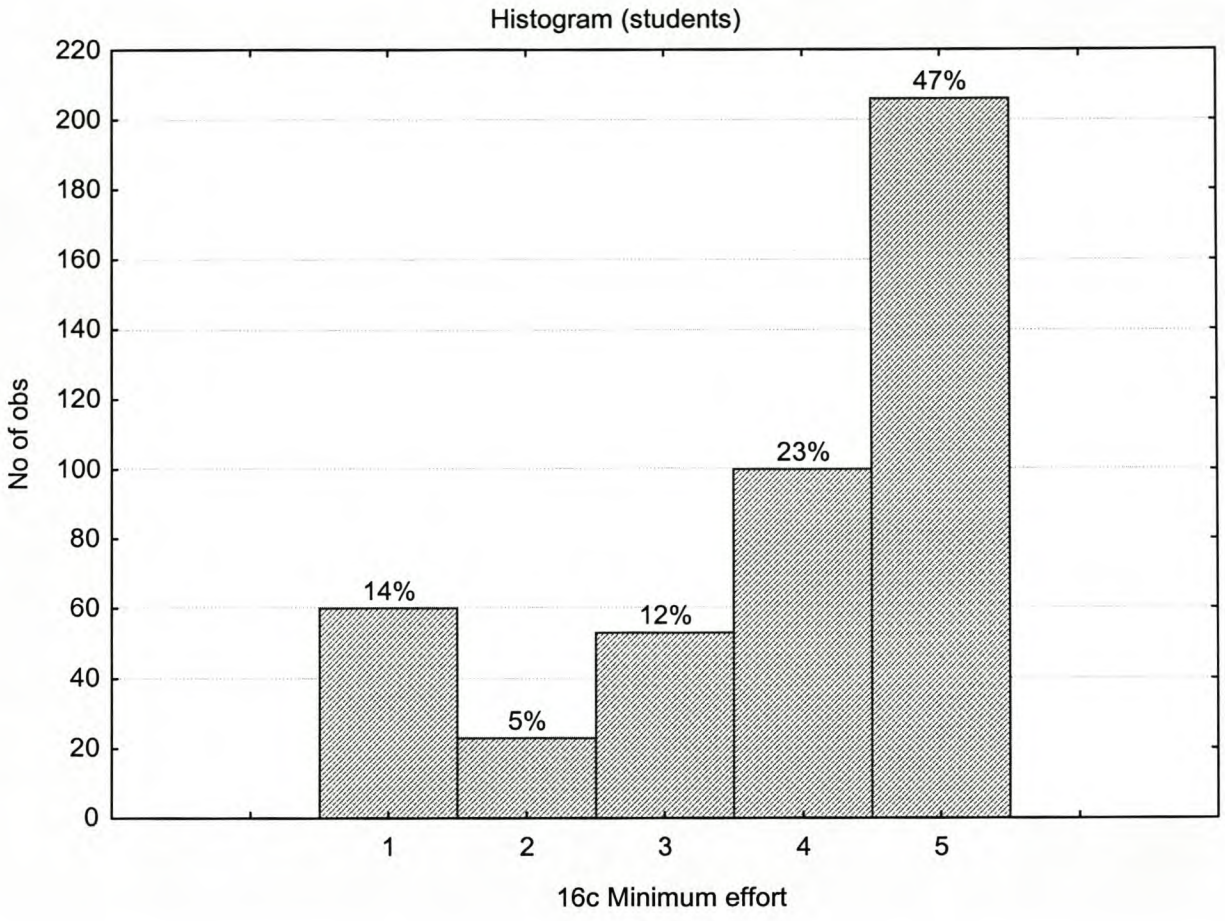

Figure 4.5: Doing academic homework

A significant difference between the attribute 5 bar and others indicates the high rating of the ability concept as part of the respondents' TLE development. However, the respondents who returned their responses for bars 1 and 2 gave a total score of 19%. The latter can be described as falling in the category of those who lack severely the task motivation and effort initiation "skills".

Item 17(a) asked the respondents "Would you say that you are a well motivated learner?" The item had a bipolar "yes" and "no" response option. The f_o score for this

item was 279 or 66% for the "yes" response. The f_e scores also showed no significant independent variable difference.

The above item 17(a) finding contrasts sharply with the f_o score in item 18 which asked the respondents to "please indicate your extent of agreement (or disagreement) with the following statement: 'I am unable to learn effectively when under pressure'" The item had five attributes and their values. The second attribute, "agree", had an f_o score of 146 or 41%. This agreement with the statement that the respondents are unable to learn effectively when under pressure contrasts sharply with item 17(a) f_o of 66% for the well motivated learner.

With regard to item 19 which asked, "If a subject-related problem is difficult to solve on your own, what do you do?" The item had three attributes

Discuss with a friend = 1
Discuss it with a lecturer = 2
Visit a campus learning support person (please specify) = 3.

An f_o score of 293 or 63% for discussing with a friend or peer support was indicated by the respondents. The f_e and f_o showed no significant association. An x^2 of 23.2707 also confirmed the f_e and f_o difference. The null hypothesis or H_o which stated that there is no significant relationship between problem solving on your own and discussing with a friend is rejected at p =.003036.

The next subcategory examined language and communication (LC) as a SAU sub-determinant.

4.6.5 Language and communication

Item 24 sought to establish a way of identifying the home language respondents use for everyday communication. All of South Africa's eleven official languages listed below are attributes of the "home language" independent variable.

Table12: Home language attributes and values

Language	Code	Language	Code
Afrikaans	1	Sindebele	7
English	2	TshiVenda	8
Sepedi	3	Xhosa	9
Sesotho	4	Xitsonga	10
Seswati	5	Zulu	11
Setswana	6	Other	12

The majority of the the respondents, in terms of the highest f_o score, were Xhosa code 9) home language speakers. They had the highest score of 223 or 47%. The f_e and f_o scores showed no significant variable association as indicated in Table 12.

Table 13: The home language expected frequencies

Summary Table: Expected Frequencies Marked cells have counts > 10 Pearson Chi-square: 490.416, df=36, p=0.00000						
24 Home language	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
1	4.85356	18.7448	4.51883	6.10879	5.77406	40.0000
2	11.89121	45.9247	11.07113	14.96653	14.14644	98.0000
3	1.09205	4.2176	1.01674	1.37448	1.29916	9.0000
4	1.94142	7.4979	1.80753	2.44351	2.30962	16.0000
5	1.82008	7.0293	1.69456	2.29079	2.16527	15.0000
6	0.72803	2.8117	0.67782	0.91632	0.86611	6.0000
9	27.05858	104.5021	25.19247	34.05649	32.19038	223.0000
10	0.12134	0.4686	0.11297	0.15272	0.14435	1.0000
11	7.28033	28.1172	6.77824	9.16318	8.66109	60.0000
12	1.21339	4.6862	1.12971	1.52720	1.44351	10.0000
All Grps	58.00000	224.0000	54.00000	73.00000	69.00000	478.0000

There is, however, no difference between the f_o and the f_e marginals. The fact that Technikon 2 reflects a high score of 104 or 47% is a significant point to note. Nevertheless, the H_o of p=0.00000 rejects the hypothesis of an association between home language and LC.

The results for item 24 can also be viewed from the percentile angle of Figure 4.6 on the next page.

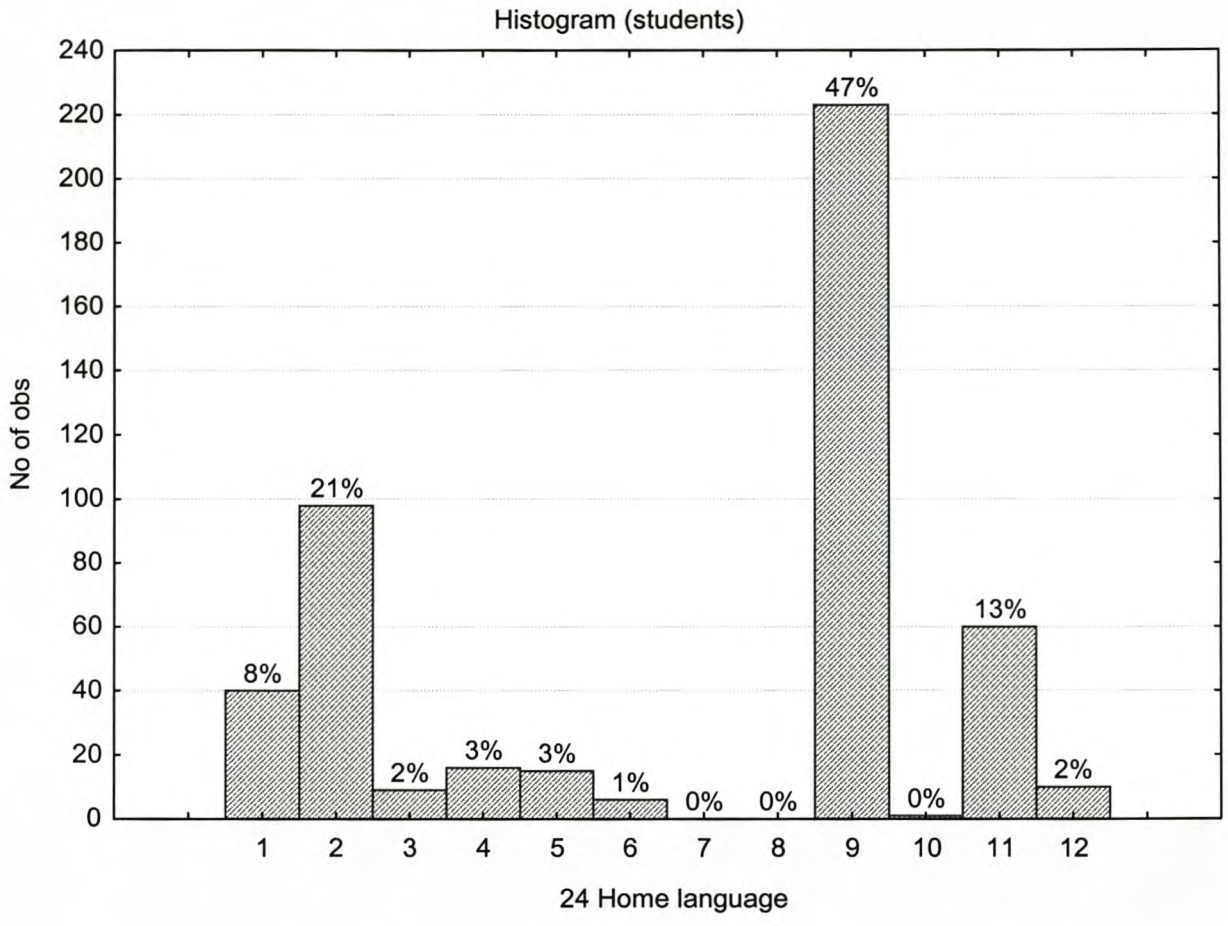

Figure 4.6: Home language

Bar 9 indicates that 47% of the respondents were Xhosa speaking. This has implications for the language underpreparedness factor to be considered in the next chapter and also for the predominant identity of sample members.

Closely related to item 24 was item 25 which asked "How often do you use your home language in EACH of the following instances?" Of the five given attributes for this item, the results of only the following two will be reported:

(b) With friends and classmates outside class.
(d) With the speakers of your own language.

These options were given the following values: Never=1, Almost never=2, Occasionally=3, Very often=4 and Always=5.

Attribute 5 had the highest f_o score of 224 or 50% for (b) which respondents "always use their home language when they are with friends and classmates outside the technikon classroom". Figure 4.7 depicts this percentile proportion.

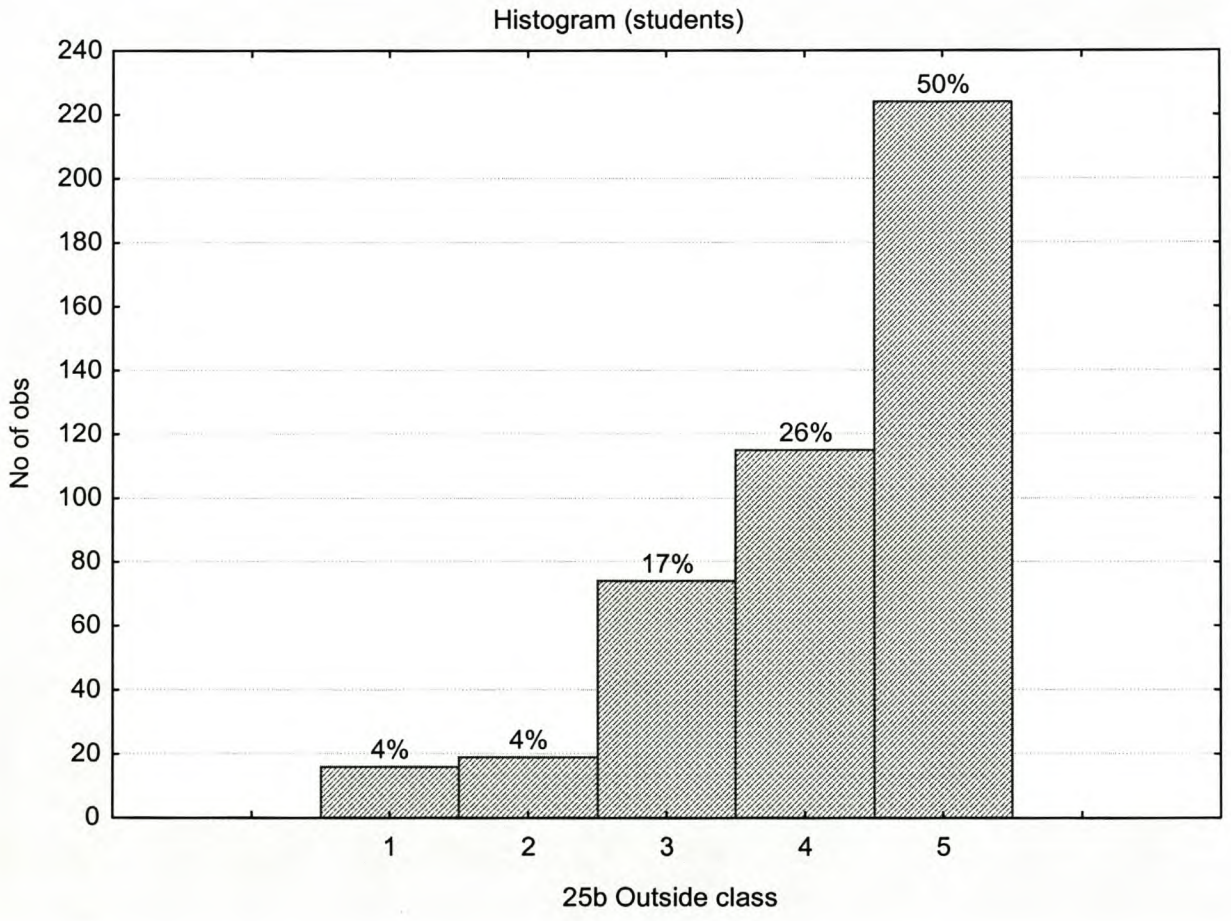

Figure 4.7: Home language use outside the classroom

A x^2 of 26.0912 showed no difference between the f_0 and f_e distributions. Attribute (d) also had the highest f_o of 331 or 73.5% for the respondents' use of their home

language at their place of residence during technikon term. Clearly, the home language was the language most commonly used by respondents.

Item 27(c) asked the respondents "If you do not understand something in class, do you find it easy to ask questions?" The response options were "Yes"=1 and "No"=2.

Table14: Observed frequencies for asking questions

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	27c Asking questions	Technikon 1	Technikon 2	Technikon 3	Technikon 4	Technikon 5	Row Totals
Count	1	35	71	31	39	40	216
Column Percent		68.63%	68.27%	72.09%	61.90%	63.49%	
Count	2	16	33	12	24	23	108
Column Percent		31.37%	31.73%	27.91%	38.10%	36.51%	
Count	All Grps	51	104	43	63	63	324

The f_o score of 108 or 33% for option 2 is of concern to the study because of a high proportion of the respondents who do not find it easy to ask questions in class. There was no significant difference between the f_o and f_e variable scores. The x^2 of 1.70677 confirms the non-existence of an association between the variables.

Item 28 asked the respondents "How easy is it for you to understand subject matter either in English or Afrikaans (if your Technikon uses any of these languages as teaching languages)?" The attributes for this item were Extremely difficult = 1, A little difficult = 2, Unsure = 3, Easy = 4 and Extremely easy =5. Figure 4.7 presents the f_o percentile scores.

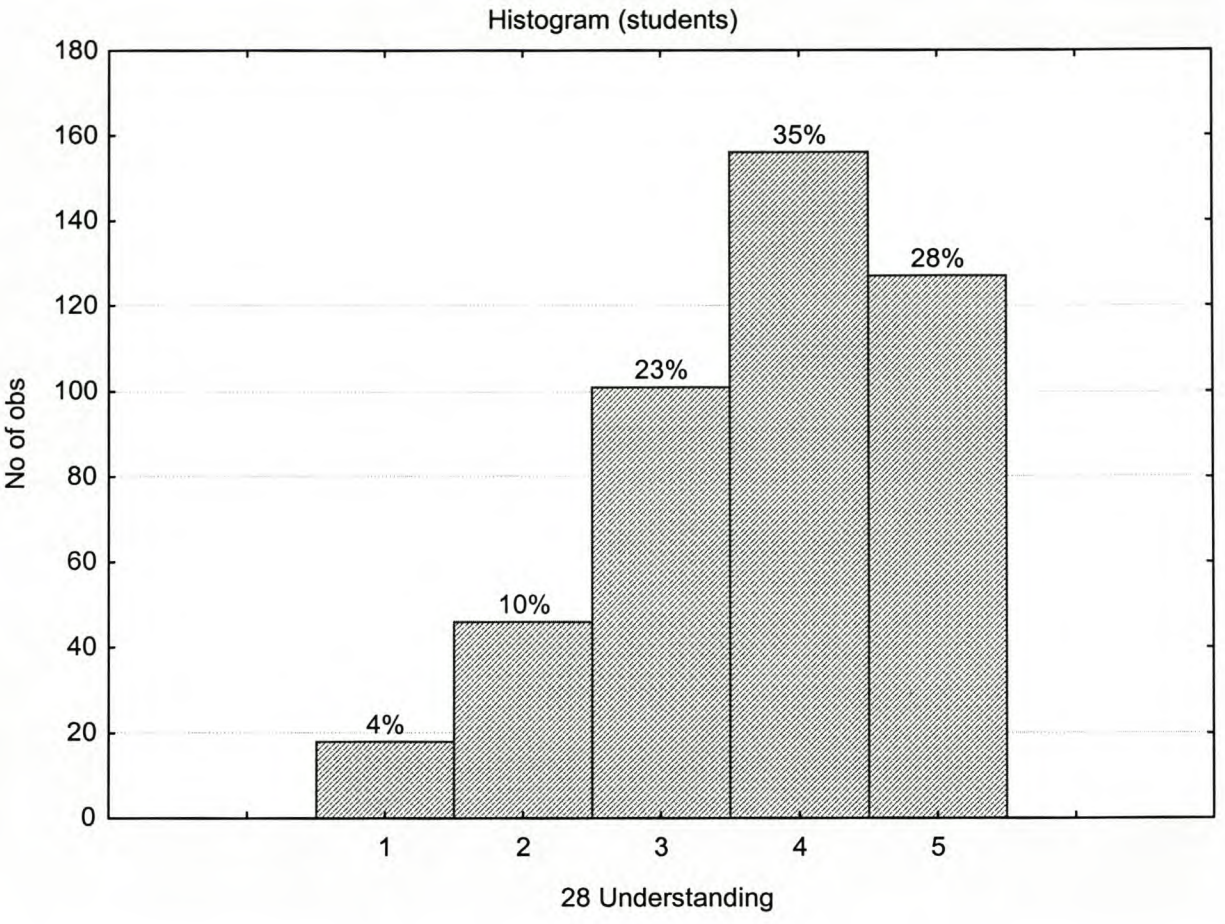

Figure 4.8: Understanding subjects in English or Afrikaans

The response category collapsing procedure is invoked here as well because of the high score, 23%, of undecided cases. Bars 1, 2 and 3 are therefore collapsed into a single response score of 37% for the respondents who do not find it easy understanding subject matter either in English or Afrikaans. The response categories 4 and 5 will also be collapsed into a single category with a total of 61%. The R total here was 448. The x^2 of 124.917 showed no significant association between "understanding subject matter" in TLE English or Afrikaans which can be interpreted to mean that other factors apart from language also determine the understanding of subject matter.

4.6.6 Learning support

There were five question items in this category. Only the findings for two items, 32 and 34, will be reported here. Item 32 asked the respondents to indicate which of the provided list of eight learning support structures were available at their technikon. The eighth one was an "other" attribute. The following list of LS structures was provided: bridging courses, extra lectures, foundation courses, self-initiated group discussions, student counselling, tutorial programmes, writing centre and other (to be specified). They had to choose between a "Yes" = 1 or "No" = 2 response option in each case.

Of the total R score of 356 for the "bridging" attribute, there was an f_o of 281 or 78% for the "Yes" option. The f_o and f_e scores were significantly different. A x^2 of 91.5123 showed no significant association between the variables.

The f_0 for the extra lectures had a total R score of 325 and an f_o "yes" score of 235 or 72% for the availability of extra lectures. Thus, most respondents had support in the form of extra lectures. The f_e had a x^2 of 41.3550 that showed no significant variable difference.

Of the total R score of 282 for the foundation courses, a "Yes" f_o score of 195 or 69% was returned. A x^2 of 72.5219 showed no significant f_o and f_e association.

The data were also analysed in terms of gender as an independent variable. Only the results of four cases are reported.

4.7 GENDER

The f_o results for item 15c which falls under the TLE category are reported first. Item 15c asked the respondents to describe their TLE by choosing options from the Likert Scaled attributes. They were asked to choose from Struggle to catch up=1-2, and Catch up quickly= 4-5 and Undecided=3. The f_o results are shown in Table 15.

Table15: Gender and catching up

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)							
	Gender	15c Struggle 0	15c Struggle 1	15c Struggle 2	15c Struggle 3	15c Struggle 4	15c Struggle 5	Row Totals
Count	1	1	16	18	39	38	16	128
Column Percent		100.00%	24.62%	36.00%	26.53%	31.93%	26.23%	
Count	2	0	49	32	108	81	45	315
Column Percent		0.00%	75.38%	64.00%	73.47%	68.07%	73.77%	
Count	All Grps	1	65	50	147	119	61	443

The invisible total scores for R 1 is 128 and for R 2 is 315. The vertical column values were male = 1 and female = 2. The horizontal values row marked 1-5 denoted the attributes. The caption "struggle" on the top horizontal of the table means those students who had "difficulty" catching up.

Although the female respondents had a high f_o of 73% for attribute 3 (undecided), their next highest score was 68% for attribute 4 (catching up quickly). This indicates that they do not struggle to catch up. The male respondents obtained a 14% lower score for their response to attribute 4. This result needs to be interpreted with caution since the sample is skewed towards female students. The x^2 of 5.41426 showed no dependence between gender and the f_o and f_e scores for the catch up attribute.

From the TLE item 16 enquiring on how the respondents do their homework, sub-item 16a with the attributes "No systematic plan"=1-2 and "Use systematic plan" = 4–5 is reported on. Attribute 3 is neutral. Table 14 shows the following gender descriptive f_o marginal score.

Table 16: Gender and planning

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	Gender	16a Plan 1	16a Plan 2	16a Plan 3	16a Plan 4	16a Plan 5	Row Totals
Count	1	13	17	25	39	26	120
Column Percent		24.53%	36.17%	23.36%	34.82%	24.07%	
Count	2	40	30	82	73	82	307
Column Percent		75.47%	63.83%	76.64%	65.18%	75.93%	
Count	All Grps	53	47	107	112	108	427

With an f_o of 75 or 93%, the female respondents in this sub-item showed a leading preference for attribute 5, i.e., systematic home work planning. The score for males was much lower , only 25% f_o for the same attribute. There was also no dependence between the f_o and f_e regarding gender and planning variables as attested by the x^2 of 6.40775.

As for the language communication (LC) category item 27, i.e., "Asking questions in class in the language of instruction", the sub item 25c with a "Yes=1" and "No=2" sub-attributes was observed. The resulting gender described f_o is represented in Table 16.

Table17: Gender and asking questions

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)			
	Gender	27c Asking questions 1	27c Asking questions 2	Row Totals
Count	1	68	22	90
Column Percent		31.78%	20.37%	
Count	2	146	86	232
Column Percent		68.22%	79.63%	
Count	All Grps	214	108	322

The female f_o score of 68 or 22% for this sub item is 36 or 44% higher than the male 31 or 78% score. Gender had no association with the "asking of questions " independent variable as shown by the f_o and f_e scores in Table 18.

Table18: Gender and asking questions

Summary Table: Expected Frequencies Marked cells have counts > 10 Pearson Chi-square: 4.63638, df=1, p=.031303			
Gender	27c Asking questions 1	27c Asking questions 2	Row Totals
1	59.8137	30.1863	90.0000
2	154.1863	77.8137	232.0000
All Grps	214.0000	108.0000	322.0000

The last two items to be reported under the gender variable are those under the learning support (LS) category. They are both in item 32 which asked the respondents to indicate the availability of the learning support structures from those that were provided. Only the f_o scores for the "departmental support" and the "foundation courses" will be reported.

Whereas the female students had an f_o score of 38 or 52% for departmental support "yes" sub-attribute, the score for male students was only 29%.

The response of the female students to the foundation course sub-item gave an observed frequency distribution or f_o "yes" score of 50% as opposed to a C subtotal of 200. The male f_o score for the same attribute was 50% against a C subtotal of 80. The result is a 15% higher score by the female respondents than the male score. The f_o and f_e scores showed no association between gender and the support structures independent variables.

The data was also analysed from the perspective of a triad of "disadvantaged" technikons', viz. technikons 1, 3 and 5.

4.8 TRI-TECHNIKON PERSPECTIVE

Only the data treatment results for two cases will be reported here. These cases are item 19 for problem solving and 27b for class explanation.

Item 19 belongs to the TLE category. It has the following three attributes with corresponding values: "Discuss with a friend" = 1, "Discuss with a lecturer" = 2 and "Visit a campus learning support person" = 3. Table 19 depicts these attributes, values and f_o scores.

Table 19: Problem solving

	Summary Frequency Table (studentsTECH135.sta) Marked cells have counts > 10 (Marginal summaries are not marked)				
	Technikon	19 Problem solving 1	19 Problem solving 2	19 Problem solving 3	Row Totals
Count	1	37	19	2	58
Column Percent		30.83%	38.00%	18.18%	
Count	3	38	14	2	54
Column Percent		31.67%	28.00%	18.18%	
Count	5	45	17	7	69
Column Percent		37.50%	34.00%	63.64%	
Count	All Grps	120	50	11	181

The table is read vertically since the attributes are arranged in that pattern. Attribute 1 shows respondents at Technikon 5 to have a higher f_o score of 7% for respondents' discussion of their subject-related problems with a friend first. In the second attribute, Technikon 1 has a 4% higher score for respondents' preference of discussing their subject-related problems with a lecturer first. In the third attribute Technikon 5 indicated a 45% f_o preference for visiting a campus learning support person first to discuss a subject-related problem.

Both the f_o and f_e showed no variable association as attested by the x^2 of 4.07355. Concerning item 27b which asked the respondents "When do your lecturers explain the subject matter in your own (the respondents') languages", there were three attributes and their corresponding values. These were "Only when asked by students" = 1, "During office consultations" = 2 and "Not applicable because they never do" = 3. Table 19 depicts the scores.

Table 20: Class explanation observations

	Summary Frequency Table (studentsTECH135.sta) Marked cells have counts > 10 (Marginal summaries are not marked)				
	Technikon	27b Class explanation 1	27b Class explanation 2	27b Class explanation 3	Row Totals
Count	1	12	4	35	51
Column Percent		27.27%	23.53%	38.04%	
Count	3	26	8	5	39
Column Percent		59.09%	47.06%	5.43%	
Count	5	6	5	52	63
Column Percent		13.64%	29.41%	56.52%	
Count	All Grps	44	17	92	153

In Table 20 we see that Technikon 5 had an f_o higher score of 52 for attribute 3, as compared to 35 for Technikon 1 in attribute 3 and a score of 5 for Technikon 3. No association between the independent variables was shown.

The data were also treated from a bipolar "advantaged" technikons' perspective. These technikons were respectively Technikons 2 and 4.

4.9 BIPOLAR TECHNIKON PERSPECTIVE

The results for two advantaged technikons will be reported here. The items in question are 17a for "Well motivated learner" and item 32 for "Self groups". Item 17a belongs to the TLE category. The f_o scores are presented in Table 19.

Table 21: Learning motivation

	Summary Frequency Table (studentsTECH24.sta) Marked cells have counts > 10 (Marginal summaries are not marked)			
	Technikon	17a Motivation 1	17a Motivation 2	Row Totals
Count	2	132	69	201
Column Percent		77.19%	69.00%	
Count	4	39	31	70
Column Percent		22.81%	31.00%	
Count	All Grps	171	100	271

Technikon 2 had a higher f_o score for both attributes 1 and 2. It had a 54 or 38% f_o higher score for attribute 1, and a 38% higher score for attribute 2. There was no significant association between technikon advantage and learning motivation as shown by the different f_o and f_e distributions. This means that being at an advantaged Technikon does not have guaranteed effect on learning motivation.

Item 32 which belongs to the LS category asked the respondents to "indicate the available support structures" from the provided list of 8 attributes and their "Yes"=1 and "No"=2 values. Only the f_o scores for the fourth attribute are reported here. The full attribute name is "Self initiated groups" which is shortened in Table 22 below.

Table 22: Self motivated groups

	Summary Frequency Table (studentsTECH24.sta) Marked cells have counts > 10 (Marginal summaries are not marked)			
	Technikon	32 Self groups 1	32 Self groups 2	Row Totals
Count	2	169	7	176
Column Percent		80.48%	46.67%	
Count	4	41	8	49
Column Percent		19.52%	53.33%	
Count	All Grps	210	15	225

The vertical f_o scores indicate that Technikon 2 had 169 cases or a 75% higher score the "yes" responses. The f_o and f_e distributions showed no association between the advantaged technikons and the attribute of self initiated groups. The results for open-ended questions are discussed next.

4.10 OPEN-ENDED QUESTIONS

These results are examined from four perspectives: all technikons, triadic technikons 1, 3 and 5, gender and bipolar technikons. Of the total of five open-ended questions, the results of a few selected cases will be reported. Some of these results will also be viewed from histogrammatic perspectives.

4.10.1 All technikons

The first case is item 8, an HSLE item, which asked "In which way(s) did the person identified in Question 7 above help you?" The responses ranged from help in the form of general support, financial support, academic help, moral support and self-management. Academic help had the highest score. Its variable was coded as "academic" in Table 23 below. The variable was also broken down into five coded attributes reflecting different ways the mentioned academic helpers helped the respondents.

These ways were coded into six attributes with the sixth one being for all non-responses.

1. Mother

brainstormed ideas with me.
helped me financially
helped me with studying

2. Father

a former school teacher, helped with studies.
helped me when mother is not at home
helped me with doing home work

3. Brother

choosing my subjects.
helped me with home work
discuss problems with him

4. Sister

translating my work.
writing projects
helping me prepare for tests

5. Friend

wanted us to compete work together
discuss class projects
study together

6. Non-response

Table 23 below, which is read horizontally, depicts the f_o score.

Table 23: Observed frequencies for ways the academic helper helped

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)							
	Technikon	Academic# 1	Academic# 2	Academic# 3	Academic# 4	Academic# 5	Academic# 6	Row Totals
Count	1	31	4	0	2	14	4	55
Column Percent		16.67%	6.35%	0.00%	8.00%	16.09%	7.69%	
Count	2	71	19	17	10	47	30	194
Column Percent		38.17%	30.16%	62.96%	40.00%	54.02%	57.69%	
Count	3	29	8	2	7	5	3	54
Column Percent		15.59%	12.70%	7.41%	28.00%	5.75%	5.77%	
Count	4	27	15	4	2	15	8	71
Column Percent		14.52%	23.81%	14.81%	8.00%	17.24%	15.38%	
Count	5	28	17	4	4	6	7	66
Column Percent		15.05%	26.98%	14.81%	16.00%	6.90%	13.46%	
Count	All Grps	186	63	27	25	87	52	440

The columns represent the attributes and the rows represent the various technikons. The table must be read horizontally since the dependent variable is arranged vertically. The horizontal reading shows an average f_o of 16,67% as the highest score for mother's help in brainstorming academic ideas with the respondent. Technikon 1 had the highest number of f_o cases for this variable. The score derives from 186 f_o cases. The x^2 of 46.5143 showed no significant dependence between the variables. Thus the null hypothesis was accepted at p=.000686.

Item 11, an HSLE item, asked "Which strategies did you use to cope with your schoolwork (e.g. study time table)?" The responses to this item were grouped into the following five encoded attributes.

4.9.1.1 Attributes for coping strategies

1.Study time table
2.Focus on task performance
3.Learning reinforcement
4.Cognitive formal operations
5.No strategies

Since only attribute 2, task performance, was selected by the respondents it is listed fully in Figure 4.9 below.

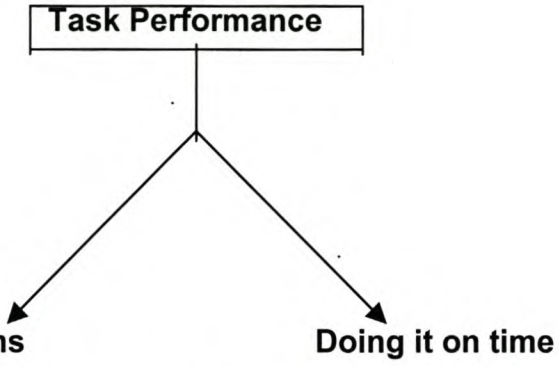

Figure 4.9: Task performance sub-attribute for coping strategies

Table 24 which is read vertically, shows the f_o distribution as follows

Table 24: Schoolwork coping strategies

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	Technikon	Strategy# 1	Strategy# 2	Strategy# 3	Strategy# 4	Strategy# 5	Row Totals
Count	1	26	6	12	5	2	51
Column Percent		15.48%	22.22%	8.11%	11.36%	8.00%	
Count	2	86	12	60	11	13	182
Column Percent		51.19%	44.44%	40.54%	25.00%	52.00%	
Count	3	11	0	36	5	1	53
Column Percent		6.55%	0.00%	24.32%	11.36%	4.00%	
Count	4	18	7	20	17	6	68
Column Percent		10.71%	25.93%	13.51%	38.64%	24.00%	
Count	5	27	2	20	6	3	58
Column Percent		16.07%	7.41%	13.51%	13.64%	12.00%	
Count	All Grps	168	27	148	44	25	412

Column 1 shows the highest total C cases of 168 for all technikon groups. Technikon 2 had the highest f_o score of 51 or 19% which attributed the school work coping strategies to effective "task performance". A x^2 of 58.7613 showed no significant association between the variables.

The data results for other open-ended items are reported under the heading triadic technikons 1, 3 and 5 below.

4.11 TRI TECHNIKON PERSPECTIVE

The f_o results for sub-item 17(a), a TLE item, are reported first. Whereas the closed item asked the respondents "Would you say that you are a well-motivated learner"?, the open-ended sub-item 17(b) was a follow up evidential question asking "how do you know that you are a well-motivated learner?" The sub-item had five grouped response attributes and sub-attributes. Only attributes 1 and 3 in figure 4.10 below are explained in detail because of their high respondent returns.

ATTRIBUTES	SUB-ATTRIBUTES
1.Academic ability*	1. Work to the best of my ability*
2. Academic effort	2. Enthusiastic/prepared for my work*
3.Self motivated	3. Able to explain something I learn*
4.Instrumental learning	4. Planning*
5.Not motivated	5. Hand things in on time*

Figure 4.10: Learning motivation and academic ability

These attributes and sub-attributes were grouped from a range of responses. The left column shows the asterisked attribute 1, academic ability, in the grouping of other attributes. The right column lists in full, 1-5, the sub-attributes for academic ability since it had the highest score. The five sub-attributes for attribute 3 are also listed separately and fully in Figure 4.9 below because it also received a high respondent return.

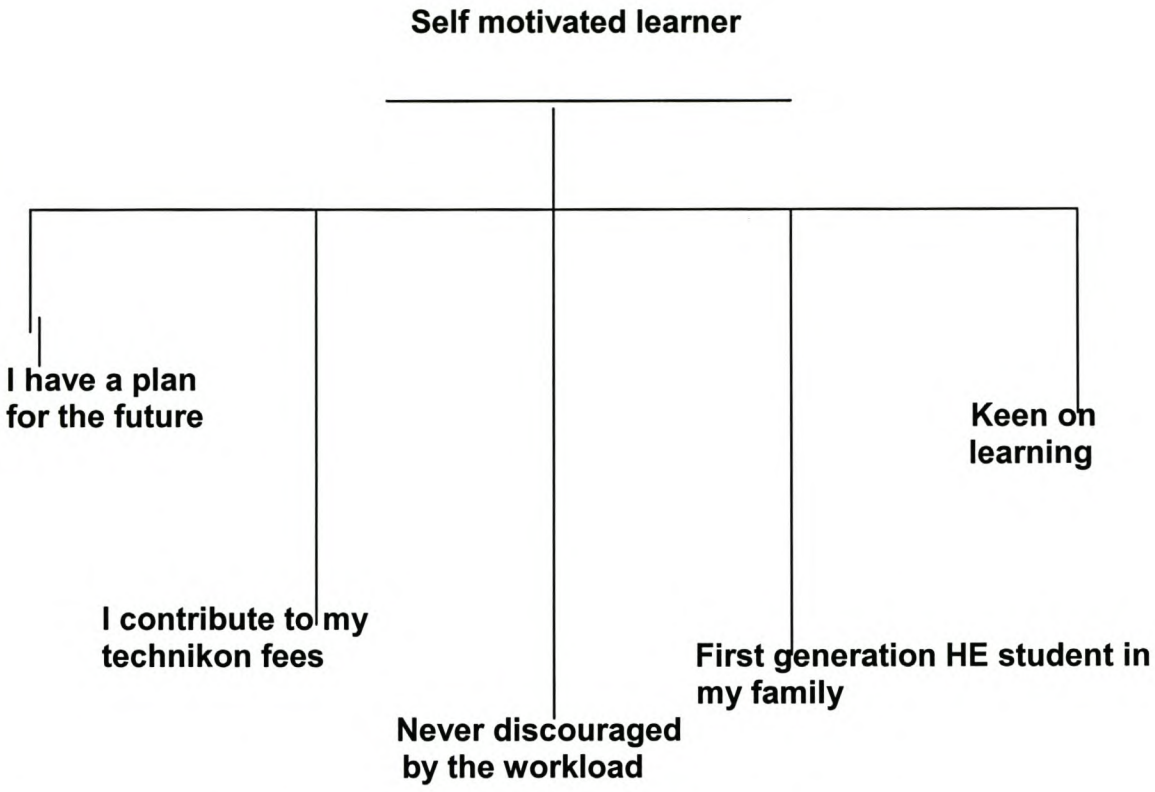

Figure 4.11: Learning motivation and self-motivated learner

The five sub-attributes in this figure aggregate the range of responses.

A vertical reading of Table 23 shows that C 3 had a high f_o attribute score of 56% for all the three grouped technikons. This means that the majority of the respondents, especially those for Technikon 3, thought they knew they were motivated to learn because of they were self-motivated. This circuitous logic casts a shadow on the reliability of this response. Table 23 depicts the item 17(b) scores. A x^2 of 20.7111 also showed no significant variable association. A null hypothesis of p = .007960 was accepted.

Table 25: Knowledge of learning motivation

	Summary Frequency Table (studentsTECH135.sta) Marked cells have counts > 10 (Marginal summaries are not marked)						
	Technikon	Motivation# 1	Motivation# 2	Motivation# 3	Motivation# 4	Motivation# 5	Row Totals
Count	1	9	16	15	1	0	41
Column Percent		60.00%	61.54%	26.79%	16.67%	0.00%	
Count	3	2	2	21	3	3	31
Column Percent		13.33%	7.69%	37.50%	50.00%	75.00%	
Count	5	4	8	20	2	1	35
Column Percent		26.67%	30.77%	35.71%	33.33%	25.00%	
Count	All Grps	15	26	56	6	4	107

Both the "strategy#" (# = means number but has no meaning here) and "motivation#" items will be reported as part of the gender analysis results because they were also analysed in detail under this part of the analysis.

4.12 GENDER

Only the "gender and school work coping strategies" and the "gender and academic support" analysis results will be reported here so as to avoid duplicating the already reported results. Since gender is a function of general information (GI), it has two sub-attributes: Male=1 and Female =2.

The f_o results for the gender operated item 11, the schoolwork coping strategies, are summarised in Table 24.

Table 26: Gender and schoolwork coping strategies

	Summary Frequency Table Marked cells have counts > 10 (Marginal summaries are not marked)						
	Gender	Strategy# 1	Strategy# 2	Strategy# 3	Strategy# 4	Strategy# 5	Row Totals
Count	1	48	9	37	10	4	108
Column Percent		28.92%	33.33%	25.17%	22.73%	16.00%	
Count	2	118	18	110	34	21	301
Column Percent		71.08%	66.67%	74.83%	77.27%	84.00%	
Count	All Grps	166	27	147	44	25	409

A vertical reading of the table shows that column 1 has the highest f_o score of 71.08% for the female respondents' preference for the "academic ability" attribute as expressing their self-motivation as learners. An f_o and f_e x^2 = 3.01975 shows no significant association between the variables.

The null hypothesis that gender has no bearing on the respondents' school work coping strategies is rejected at p = .006020.

Item 31, "Does your course department at the technikon have a support programme for academically struggling students" is the last open-ended item to be reported. It is an LS function which is reported here under the gender observed frequency distribution for "support#". Its attributes and values are as follows:

ATTRIBUTES	VALUES
1. Supplemental instruction	1
2. Tutorials	2
3. Lecturer support	3
4. Mentoring skills	4

Figure 4.12: Attributes and values for departmental support

Table 25 below presents a gender observed f_o for the departmental academic support service for all 5 technikons.

Table 27: Gender and departmental academic support

	Summary Frequency Table (studentsXXa.sta) Marked cells have counts > 10 (Marginal summaries are not marked)					
	Gender	Support# 1	Support# 2	Support# 3	Support# 4	Row Totals
Count	1	57	20	14	5	96
Column Percent		31.84%	42.55%	27.45%	83.33%	
Count	2	122	27	37	1	187
Column Percent		68.16%	57.45%	72.55%	16.67%	
Count	All Grps	179	47	51	6	283

A vertical reading of the table shows that of the 179 respondents in column 1, 68 or 16% of them were female who indicated the supplemental instruction (SI) programme to be the most common academic departmental support. An f_o and f_e and x^2 of 9.39506 showed no association between gender and academic support. The null hypothesis that, from a gender perspective, the technikons have no departmental academic support was rejected at p=.024479.

The results for the semi-structured interviews are considered separately and lastly because of their qualitative and narrative nature.

4.13 SEMI-STRUCTURED INTERVIEWS

The semi-structured interview was used because it allows for flexibility, openness, and a more relaxed interface between the interviewer and interviewee (Babbie & Mouton, 2001: 289). This was useful for gaining an "insider" perspective and allowing the interviewees to steer the discussion among themselves with minimal interviewer intervention.

One focus group, one telephone interview and four individual semi-structured interviews were conducted (see Appendix E). They were conducted across the technikon sample to obtain the faculty and academic support/development staff "insider" perspectives on student academic underpreparedness. These are reported thematically rather than as individual institutional viewpoints because of some interviewees' preference for anonymity. The research method, interviewing techniques and data results will be reported distinctly.

4.13.1 Research method and protocol

The qualitative research data gathering method, as mentioned earlier in the chapter, formed part of a triangulated research method (Leedy, 1989:143). Babbie, *et al.*, (2001:289) mention four characteristics of a qualitative research data gathering method:

- A detailed engagement/encounter with the object of study.

- Selecting a small number of cases to be studied.
- An openness to multiple sources of data (multi method approach).
- Flexible design features that allow the researcher to adapt and make changes to the study where and when necessary.

The link persons at each of the institutions facilitated a detailed engagement with the target respondents. That engagement helped in selecting a small number of staff respondents who were directly involved in helping academically "underprepared" students improve their performances. The semi-structured nature of the interviews allowed for a multiple data sources flow while providing a flexibility that allowed the researcher to adapt and make changes as and when necessary.

The semi-structured nature of the interviews is evident in the limited schedule specification of some questions. However, other questions arose naturally in the interviews themselves (see Appendix C) (Walizer & Wienir, 1978:287).

4.13.2 Interviewing procedures

Babbie, *et al.*, (2001:289) describe the qualitative interview as "a conversation in which the interviewer establishes a general direction for the conversation and pursues specific topics raised by the respondent." This flexible interviewing technique prevailed in all of the interviews because it facilitated a good rapport between the interviewer and the respondents. Although most of the interviews were structured for a 45 minute time slot, others had less or more than that time.

The "transmittal letters" (Leedy, 1989:190) requesting interview cooperation were faxed to the institutional link persons at least three months before the scheduled interview dates. Reminders were sent via email. Some cases also required

telephone tracking and follow-up. The institutional link persons identified the appropriate personnel to be interviewed.

4.13.3 Interview bias

Walizer, *et al.* (1978:287) caution that interview bias is often one of the key factors impairing data quality. Thus, efforts were made to minimise bias in the structuring of the questions as well as in the interview process itself. However, Walizer, *et al.* (1978:287) also advise that "It is probably safe to say that one can never be certain that interviewer bias has been totally eliminated from any particular piece of research which relies on the interview for data collection." This observation was borne by the interviewer's experience with the quality of some of the interviews. At some point during interviewing, the interviewer also struggled with controlling his bias because of some common professional experiences.

That bias has been used as a basis for eliminating the ideological complicity cases so that the objectivity, validity and trustworthiness of the research are not affected (Babbie, *et al.* 2001:274). That elimination also serves a useful purpose of ensuring that only the reported cases will be discussed in the next chapter.

The interviews were structured to have six thematic line items:

1. Admissions policy
2. Cultural deprivation
3. Cognitive deprivation
4. Language policy
5. Academic support/development
6. Recommendations

As these items were not absolute, the flexibility of the interviews allowed for improvisation. The abridged interview transcripts will be used for verbatim reporting.

4.14 RESULTS

The focus group results are reported first and then they are followed by the telephone interview and concluded with two individual interviews.

4.14.1 Focus group

Babbie, *et al.* (2001:292) describe the focus group as allowing the gathered people to create a shared meaning among themselves. The group consisted of three participants from one of the disadvantaged technikons. These were staff in academic development, student counselling and student affairs who had a direct interface with "underprepared" students. Only the coded response designations are used to denote them because of the anonymity protocol of the research. The researcher/interviewer is identified through the code **SN**.

4.14.2 Student backgrounds

Instead of approaching the discussion straight from the weighty aspect of admissions policy, it was approached indirectly by first reflecting on the respondents' knowledge of the students' backgrounds.

> **SN:** Is academic underpreparedness linked to the backgrounds where students come from, i.e., disadvantaged communities?
> **VM:** We are in an unfortunate situation in that students from our communities are not well prepared and they don't get good school passes and we have to absorb them because they are closer. But if they get good passes they go elsewhere.
> **SN:** Where do they come from?

FS: From surrounding rural areas because we are in a rural area. Those from urban areas are far outnumbered by the rural ones.

Obviously, the interviewees felt strongly that underpreparedness at their institution is also an inevitable fact of their rural location.

4.14.3 Home learning support

This item asked the respondents to share their views on the students' home learning support because "informal" educational development begins in the "home curriculum" (Redding, 1992).

SN: Does home play any role in developing your students?
VM: If it is academic development there is not much role for home. Development is not like a sandwich, it is integrated. Exposure to experience is a form of development. Academic development varies, e.g., career guidance. If I come from a family of educated brothers they can play a role in a student's academic development but if I come from a non-educated family then I am disadvantaged.
LM: Importance of social development at home plays an important socialisation role.
FS: Our students come from rural backgrounds and Eastern Cape is one of the poorest provinces. To a large extent people rely on pensions and subsistence grants and whatever we have was provided by the homelands. Industries in Butterworth have left. So most students cannot afford to pay their fees.

Home social development, regardless of the indigency of the students' rural families, was emphasised as the foundation for future academic development.

4.14.4 Language

This item asked the respondents to share their perceptions of the role of language in academic underpreparedness.

SN: Can language be used as a tool of empowerment from underpreparedness to preparedness?

> **VM:** Language is crucial because it transfers knowledge. If students fail to master English then they are disadvantaged and most of the time the student knows what he wants to ask but cannot express it in the form of language. If students fail to master English they have limitations in hearing the lecturer. Language development should be central if we talk about underpreparedness because it unlocks the barriers. Not only understanding the lecturers but expressing themselves as well.

Linked to this item is the code switching/mixing aspect which is reported next.

4.14.4.1 Code switching/mixing

SN: Do your students think (sic) between Xhosa and English?
FS: Yes.
VM: Yes, you can see the Xhosa written in English. It is a serious problem.
FS: I feel strongly about language because language has to be the basis for intervention.

Clearly, there was a strong emotional current running through the discussion of this point. Hence, it also had to be examined from the angle of counter posing Xhosa with discourse.

4.14.4.2 Xhosa and discourse

It was considered that the link between Xhosa and discourse is critical because, as it was suggested in point 3.2.1 of Chapter 3, such a link establishes interdiscourse between an L1 and L2.

> **SN:** Is Xhosa influence affecting discourse strongly in your view?
> **SN:** [Clarifying above question] Do you see the oral background as an obstacle to becoming professional?
> **VM:** African communication differs from western. There is always a difference between the written and verbal communication. Written communication is limited in that you cannot sense mood, for instance. Sometimes the quiet students do well in written communication than the outspoken ones.

The discussion then moved to consider the role of support services in facilitating learner centred or peer help support structures where the learners direct their learning.

4.14.5 Support Services

> **SN**: What do support services do for peer help?
> **LM:** There are peer helpers and they are trying to help students.
> **FS**: Academic support is not a priority at the institution. The human resources element has to change in that we are understaffed. Academic faculties want us to play a significant role holistically. When you approach lecturers they cry about time slots about life skills. They don't value life skills for what it is but because SERTEC [Certification Council of Technikons, SN] prescribes for its inclusion.

Understaffing and non-integration of life skills into lectures is clearly a strong point of concern for the respondents, especially since their institution was an HDI.

4.14.6 Workstudy

The workstudy point arose because it had been mentioned at the introduction of the interview and it seemed to enliven the discussion at that point. Thus, it was explored further because it also seemed to have some latent useful information.

> **SN:** Will workstudy mainstream your services?
> **FS:** One of our aims is to penetrate the academic faculties. It is one of our trump cards. We are also trying to establish a unit for academic support.
> **LM:** It is a form of experiential training.
> **SN:** Are your services "project" orientated?
> **VM:** The word "project" is a (sic) USAID terminology. They use indicators, planning, outcomes, evaluation and I like the terminology because it keeps you on your toes.
> **SN:** Do you see workstudy as a new model for academic development?
> **FS:** Yes, we want this to become an institutionalised project.

The interview concluded with a question on effort and strategy.

4.14.7 Effort and Strategy

SN: Do your students lack effort and strategy academically?

FS: With the students we have there is general lack of motivation which I do not know if its related to the disintegrating school system.

The next results are from a telephone interview which was conducted from Stellenbosch University with an academic development staff at another technikon.

4.15 TELEPHONE INTERVIEW

The interviewee was an English for Academic Purposes (EAP) lecturer from a historically advantaged technikon. The EAP course was for first year students. The first item to be discussed was the admissions policy because it is often a filter for selection and student placement.

4.15.1 Admissions policy

An introduction of this subtopic was given to the respondent as an interview preparatory cue.

SN: What are your requirements?
SV: I don't know but I have engaged with colleagues to research, test for academic underpreparedness and establish language levels and requirements for students who are L2 English speakers and users. One of our recommendations is for the technikon to look at academic underpreparedness.

With the latter point the interviewee took the discussion to the next level.

4.15.2 Academic Underpreparedness

SN: Is cultural deprivation a major aspect of academic underpreparedness?

SV: I think the major factor is lack of education or being insufficiently prepared for HE.

The notion of a lack of education or insufficient HE preparation reflects indirectly the lack of expert mediational stimulation that is of vital necessity for "underprepared" students learning capacity development.

4.15.3 Student backgrounds

SN: Have most of your students gone through poor schooling?
SV: Yes, but not all.
SN: How do you describe poor schooling?
SV: One of the biggest disadvantages is the background from school and home which is not highly literate and this makes it difficult with English levels and so they are unfamiliar with text type or acceptable writing practice and that stems from lack of literacy, lack of school resources and inadequately trained teachers.

The interviewee's strong emphasis on the language aspect brought the discussion inevitably to the amplification of this point.

4.15.4 First and second languages

SN: Do they have to shuttle between the L1 and L2?
SV: They do a bit of code switching but its not a really bad thing.

The acceptance of code switching implies that the respondents' EAP programme allows interdiscourse to inform the learners' classroom L2 acquisition experience.

4.15.5 Cognitive problems

As it is the study's hypothesis that cognition is often another key affected area in the "underprepared" students, this issue was next for consideration.

SN: What are major cognitive problems?
SV: Difficult to quantify.
SN: Is linear thinking skills one of the problem areas?
SV: I think there is a problem with that especially the inability to apply what you have learnt. The educational background is responsible for rote learning, memorisation of facts, not questioning and waiting for someone to tell you what to do and what not to do which is clearly not the kind of approach expected at tertiary level.

The next item explored the "underprepared" students' attitudes toward learning.

4.15.6 Attitudes to learning

SN: Is learning not the learner's responsibility?
SV: Yes, but if we do not have the tools for accessing information in that media of learning then effective learning cannot take place.
SN: Is effective learning inhibited by factors outside of learning?
SV: Yes, outside of learners' control but once they are currently admitted to institutions they do not have an adequate level of English.

Two major learning inhibiting factors, *viz.* lack of institutional tools for information accessing and students' inadequate English levels, are often the major factors affecting the quality of teaching and learning at HDIs.

Because the EAP course is one of the important preparatory courses, this item was explored next.

4.15.7 Departmental affiliation and EAP

SN: Your department?
SV: We come under the department of language and communication and EAP which is a communication course module.
SN: How are you offering EAP?
SV: It is part of the student mainstream and they have four weekly periods. They were tested at the beginning of the year using the Placement Test in English for Educational Purposes and we decided that students who got below 45% would attend EAP.
SN: Do you consider this a working model?

SV: Yes, we offered it as a pilot last year and we are continually refining and modifying materials and improving it as we go. The structure is workable and maybe it will be argued in the long run that it should be credit bearing.

4.15.8 Student feedback

Considering the fact that EAP was not credit bearing, it was deemed necessary to take this point further by examining the notion of student course feedback.

SN: What is students' feedback?
SV: On the whole it is positive in my case and the students find it helpful although some students have some reservations about the course.
SN: What are the reservations?
SV: We have a number of students who are Indian and English is their first language, but a number of my students are more mature students from the workplace and they feel the course benefits them but they see it as meant for "underprepared" students. One or two students got a good mark for matric and do not understand why they must attend the course [pause].
SV: [Continues] I have a good mark in English and I don't have to do this course. Our response was that this is not a course in English but an academic literacy course. There are some SI classes conducted in maths, there is a maths tutorship.

The next item was a general concluding question.

4.15.9 Doing things differently

SN: If you were to do things differently what would you do differently in terms of your work?
SV: I would say that from work we have done it seems clear that students below a certain level are not likely to succeed in their studies. I believe it is incorrect to accept students not likely to succeed but if you do accept such students you must be there to help them succeed. If you get students below 45% and are not likely to succeed, we need to give them something more than an EAP course and are not doing the full course. All institutions should be doing this.

The next reported results are for two individual interviews, i.e., individual interview 1 and individual interview 2.

4.16 INDIVIDUAL INTERVIEW 1

Unlike the focus group and telephone interviews, the basic individual interview is an "open interview" (Babbie, *et al.* 2001:289). This interview was conducted at an HDI technikon with a senior staff member (head of a department). Its point was to examine SAU from a senior academic staff member's perspective. This is important because the respondent had twelve years experience at that technikon.

The first item to be considered was the AU factor.

4.16.1 Academic underpreparedness

> **SN:** Is academic underpreparedness a problem of your institution?
> **BA**: Yes, particularly language, i.e., English. Many of our students come from disadvantaged backgrounds and some of our teachers are themselves not very proficient in the language [English]. There are teachers teaching English in the vernacular, i.e., Xhosa, so students do not practise English and they are not prepared language wise. This is what keeps them back in their courses.

The above language comments made this point the next interview item.

4.16.2 Language

> **SN**: What is the language policy of your institution?
> **BA:** English – communication in English which is a credit subject.

4.16.2.1 Code switching

> **SN**: Do you experience student code switch between English and Xhosa?
> **BA:** We have noticed that students who underperform in English underperform in other courses as well.

Although the above question was not answered here, it was however answered in the next point.

The interview then moved to the language support aspect.

4.16.3 Language support

> **SN:** What language support is provided?
> **BA**: Computers and other programmes to address reading skills and comprehension exercises. They sometimes code mix and they would rather use their mother tongue.

The next point considered the course concepts in order to assess the interviewee's perception of their importance in relation to academic underpreparedness.

4.16.3.1 Course concepts

> **SN:** Any concept specific problems?
> **BA:** Memorisation is the major problem.

To elicit more information the above question was reformulated as a problem-solving item.

4.16.4 Problem solving

> **SN:** How is problem solving possible without concept definition skills?
> **BA**: Students can define concepts in mother tongue and return to English.

This point was pursued further with specific examples of basic concepts.

4.16.5 Basic concepts

SN: Do students experience problems with basic concepts like abstract and "minutes"?
BA: Yes, this is a serious problem. We do a lot of practise to define those concepts. We really scale them down. [Respondent meant that they do their best, SN]
SN: Do you have time for that?
BA: No, we are limited. [Respondent refers to time and resources, SN]

The discussion proceeded to examine the attitude of students toward learning and lecturers.

4.16.6 Attitude to learning and lecturers

SN: Do students own learning or do they come regularly to see you with problems?
BA: My doors are open but the fear of the teacher is still there and it boils down to the language problem. One or two do come. The problem is that they think the teacher is always right.

It was considered necessary to link the above point to the notion of disadvantage.

SN: Are your students from rural backgrounds?
BA: Yes.
SN: Do you describe them as being from disadvantaged backgrounds?
BA: Yes.
SN: Do they define themselves in this way?
BA: They accept it and that is what hurts me because there are some of the things they have I never had as a student.
SN: Why do you say that?
BA: They come in and they are shy and they tend to accept they are not as good as those from white schools.
SN: You link psychological attitude of accepting disadvantage to withdrawal?
BA: Yes, even with Xhosa they don't contribute in class and it is worse with English.

This point on disadvantage was also examined from the perspective of students' fear of making mistakes.

4.16.8 Fear of making mistakes

> **SN**: What body language do they use to communicate what is going on inside?
> **BA**: They sometimes smile and I ask them what are you smiling about and nothing, no response.
> **SN**: Is this problem linked to fear of self-exposure?
> **BA**: Yes, that is the crux of the matter! Fear to make mistakes.

The next strategy was to determine, in conclusion, if there is any link between fear to make mistakes and self-confidence.

4.16.9 Self-confidence

> **SN**: Does low self-confidence affect academic preparedness?
> **BA**: Yes, it is a problem but some do succeed at second year but many struggle.

Lack of self confidence is linked to fear of making mistakes which, in turn, reflects a low self esteem in language use. The "individual interview 2" item, which is considered next, will conclude the report on the interview results.

4.17 INDIVIDUAL INTERVIEW 2

The interviewee was also a senior academic development staff member at an HDI technikon.

The interviewee's job title was the following

- Teaching improvement and helping students.
- Curriculum development for teacher training, student support, e.g., bridging, SI and life skills.

The first question item explored the role "students' background" plays in underpreparedness.

4.17.1 Student backgrounds

SN: Which schooling backgrounds do your students come from?
LS: From rural backgrounds and 1% white (model C schools) and few Botswana students.
SN: Are they predominantly Xhosa speaking?
LS: Yes.
SN: Do you consider them as having been sufficiently prepared by the schools for HE?
LS: No. 40% of them the schools they came from had no libraries. They entered a library for the first time here. They rely on rote learning and they have severe English problems which is 40% below the national norm of English second language.

The discussion proceeded to examine "academic performance" as a factor of underpreparedness.

4.17.2 Academic performance

SN: Can you mention two things these students are unable to do?
LS: No note taking skills. If the lecturer is talking they can't take down notes. When they don't understand they are too shy to ask. Some approach lecturers if they don't understand.
SN: What is the cause of this shyness?
LS: This wasn't part of their school culture, i.e., discussion was not encouraged.

The next point considered the role a home should play in supporting a student's academic development.

4.17.3 Home learning support

SN: Is the home playing a vital role in learning support?
LS: Yes. If parents encourage you, studying is seen as a priority at home and television should not be so loud a priority, then they can study effectively.
SN: Is economic and illiteracy factors a cause of this shyness?
LS: I cannot say there is a direct link between these two. I know that many of them come from difficult economic backgrounds, they make do with R150.00 a month for food and everything and so they cannot buy a notebook and they will share a notebook.

The discussion was taken further to the point of "academic support" as an academic performance lifeline for "underprepared" students.

4.17.4 Academic support

SN: What is your academic support program?
LS: It varies from departments to departments but "D" is the common matric requirement.
SN: What kind of ASPs/ADs are linked to academic performance?
LS: No direct link but we have a tertiary foundation course for maths and science. We do have a programme for those who want to enter a secretarial office administration programme. They enter a four year instead of a three year programme.
SN: Is the matric symbol reliable for admission assessment?
LS: Yes, especially in the absence of something better. This is especially the case for maths.

Considering that the HDI term is often used to describe the under-resourced technikons, it was deemed necessary to touch on this point.

4.17.5 The HDI term

SN: How do you describe the institution?

LS: As an HDI.
SN: Why?
LS: Because we were initially the ....[name of region omitted, SN] Technikon and our students came from there.
SN: How are your facilities?
LS: I think we are doing well on the facilities especially because the technikon was started in 1988. As there has been HDI redress, we have benefited from government funding than HAIs.
SN: Are you becoming empowered?
LS: Technologically yes, but we don't have the organisational structure of support services.

Exploration of the HDI term opened the way for examining the kind of academic redress initiatives that seek to reverse the disadvantage etiology.

4.17.6 AD programme highlights

SN: What are the highlights of your AD programme?
LS: Our major AD programme is SI and it is one of the strongest in the country. Life skills covers study skills, personal achievement, relationships and finance management. The other side is teacher development in the form of OBE [outcomes based education] implementation and in first year SI integrated programme is being pioneered.

The SI programme was the most common support programme in the majority of the technikons in the sample. It was also necessary to consider the mechanism linking the respondent's AD initiatives with the faculties.

4.17.7 AD and faculties

SN: What is the relation between your unit and faculties?
LS: I offer life skills to all departments as a course. I advertise SI at the end of the year. I check the low pass rate subjects and advise them [lecturers] to enlist with the programme.
SN: How many faculties do you have?
LS: We have two.

It seems that the respondents AD model is also centralised around the SI programme.

Another critical factor is the external support received by HDIs to help them reverse their deficiencies. This is considered next.

4.17.8 External support

> **SN**: Is there any external funding?
> **LS**: We have TELP funding helping us look at language support, basic study skills, literacy and computer literacy.
> **SN**: What is TELP?
> **LS**: TELP is sponsored by USAID [inaudible] ten year support grants limited to HDIs.
> **SN**: Do technikons collaborate as technikons?
> **LS**: No, but there is government pressure for that to happen.
> **SN**: Is the TELP language programme aimed at addressing the SAU?
> **LS**: Yes! You have to deal with the most basic things like can a student speak in the language of instruction, can he access information on the computer, can you function with the computer – these are important for alleviating the difficulties.

It is important to note the indirect role of funders in precipitating institutional collaboration through programmes such as TELP.

4.18 CONCLUSION

The Chapter first distinguished between the design and methodology. It described the population composition characteristics such as Technikon coding from 1 to 5 and "HDI" and "HAI" distinctions. The sample, its size and representativeness were also explained. The sample was triangulated through a combined use of convenience and

quota sampling techniques. The data analysis section described the questionnaire and the triangulated quantitative and qualitative methodologies.

The six dependent variables of general information (GI), home background (HB), high school learning experience (HSLE), technikon learning experience (TLE), language and communication (LC) and language support (LS) were used as a frame for data analysis. The analysis determined the expected frequency or f_e and observed frequency or f_o distributions whose results were reported through contingency tables and bar graphs. The Chi square or X^2, the null hypothesis or H_o and the degress of freedom or df values were also determined. Both the closed and open-ended question analysis results were reported quantitatively. The open-ended questions were clustered into units of similar responses that facilitated better analysis.

The qualitative results emanated from an analysis of AD staff interviews on SAU dependent variables, especially as it concerns the hypothesised micro L1 IsiXhosa, TLE English L2, effort and strategy independent variables. The macro dependent variable considered the institutional SAU responses especially in the form of independent variables like support programmes, i.e. EAP, SI, workstudy, etc. The role of external funders like the Desmond Tutu Educational Trust (DTET) and the United States Agency for International Development (USAID) was also mentioned by interviewees as spurring the institutional SAU responses.

The data indicate that within the sample there was widespread academic underpreparedness expecially within the six disciplines that were analysed. There is

a disparity in that in the spread which reflects an unevenness in the SAU distribution among so-called advantaged technikons and disadvantaged technikons. That disparity was also suggested in the interviews with the staff members who pointed out that it is not only the students who are underprepared, but also some the staff. The institutions appear to be seriously underresourced.

The implications of results for the research problem and the study as a whole are discussed in the next chapter.

CHAPTER 5

DISCUSSION OF RESULTS IN THE CONTEXT OF VOCATIONAL EXCELLENCE

5.1 INTRODUCTION

The data analysis results in the previous chapter are discussed in relation to the problem as identified in Chapter 1, as well as to both the first and second hypotheses. The second language (English), the cognitive and higher order thinking (metacognitive) skills and institutional academic underpreparedness (AU) responses that form the core of the findings will be discussed from a descriptive survey viewpoint. A concluding appraisal will be made for anchoring underpreparedness reversal on Engelbrecht's notion of vocational proficiency and excellence, as it was presented in point 3.2.2. of Chapter 3.

There is a transformation continuum, the study contends, from academic underpreparedness to preparedness. That continuum ensues from the notion that successful student academic performance depends on appropriate deployment of effort and strategy to the academic competences required at the technikon learning level.

The discussion is divided into three parts, relating to second language (L2) and cognitive/higher order thinking skills 'impairments' and the technikons' responses to such impairments. Both the first and second hypotheses will be used in guiding the discussion.

The seven focuses of the questionnaire, i.e., general information (GI), family background (FB), high school learning experience (HSLE), technikon learning experience (TLE), language and communication (LC) and learning support (LS) will be used in focusing the discussion on the implications of analytical results in the previous Chapter.

5.2 IMPLICATION OF RESULTS FOR THE RESEARCH PROBLEM

Most of the results of expected frequency (f_e) and observed frequency (f_o) distributions confirm that the technikons have identified second language and cognitive factors constitute a major challenge for the technikons' SAU programme responses. In the statement of the problem, a contention was made that the SAU concept is used loosely and often interchangeably at the technikons, with specific reference to the historically disadvantaged institutions (HDI), historically disadvantaged students (HDS), historically black institutions (HBI), historically advantaged institutions (HAI) and historically white technikons (HWT) terms. The latter are adjunct student academic underpreparedness (SAU) terms, as it was contended in section 1.5 of Chapter 1.

The results, especially the qualitative ones, indicate that the concepts of disadvantage or advantage are distal or extrinsic to the situation of core cognitive structural impairment (Feuerstein *et al.*, 1991:17). They are symptomatic of the underpreparedness etiology. However, the L2 (English) and the cognitive and higher order thinking skills input impairments constitute the proximal core features of underpreparedness (Feuerstein *et al.*, 1991:17). This point was made in Chapter 2

where the review of salient literature contended that proximal (intrinsic) factors like linguistic and cognitive input processing impairments account for the major SAU proportion. It was also argued in Chapter 3 that a school inherited lack of effort and strategy for successful academic task performance is responsible for impaired capacities and abilities of "underprepared" students.

5.3 IMPLICATION OF RESULTS FOR FIRST LANGUAGE ISIXHOSA

Since most or 47% of respondents, in figure 4.6. on Home language (HL), claimed IsiXhosa as their first language or HL, the substantive discussion of the role of first language in facilitating additive bilingual learning will be limited to IsiXhosa L1. In section 2.1 of Chapter 3 it was suggested that Gough's (2000:47-50) notion of "interdiscourse", i.e. interaction and cross-fertilisation between an L2 English and Xhosa oral genres, can be useful in facilitating the students' technikon oral class project presentations. That suggestion is also alluded to in the "focus group interview " where the limits of writing, especially in relation to mood, are mentioned by the interviewees.

Oral rhetorics, in terms of the interviewees, has a potential for transcending that mood limitation. For example, the respondents mentioned that "African communication differs from the western. There is always a difference between the written and verbal communication. Written communication is limited in that you cannot sense mood, for instance. Sometimes the quiet students do better in written communication than the outspoken ones" [Focus group interview].

These oral features often contain untapped reservoirs of "indigenous knowledge systems" (IKS)[24]. Such reservoirs could facilitate an additive L2 English acquisition. This viewpoint is supported by one of the technikon interviewees, an English for academic purposes (EAP) lecturer, who mentioned that she had no problem with learner codeswitching the in the classroom when asked about shuttling between L1 and L2 ("They do a bit of code-switching but it's not really a bad thing").

It is interesting to note that for item 25, which asked the respondents "How often do you use your home language in EACH of the following instances?" the following scores indicated the levels of HL use at technikons:

(b) With friends and classmates outside class = 50%
(b) In your study group = 35%
(c) With speakers of your own language = 74%
(d) At the place where you live during term time = 59%

The scores tell the story of high level HL use in some areas, but low use in study groups.

5.4 IMPLICATION OF RESULTS FOR SECOND LANGUAGE ENGLISH

The item 9 "fairly often" option with an f_o of 49% for the teachers' use of English at the high school learning experience (HSLE) level was a strong indication of the respondents' exposure to English L2 instruction, as shown in Table 5. The item's key concepts were English and understanding. The 23% of respondents who indicated being occasionally exposed to the instructional use of English is also important

[24] See 3.4 for treatment of IKS.

because it is likely that they would be underprepared for academic challenges at a technikon.

However, there is no guarantee that even 49% L2 English exposure was inadequate for the HSLE linguistic grounding since the quality of that English input may have lacked grammatical richness and acqusitional depth. This viewpoint is supported by an observation by a respondent (Individual interview 1) who, when asked whether academic underpreparedness is a problem at his institution, indicated, for example, that:

> "many of our students come from disadvantaged backgrounds and some of our teachers [at the interviewee's technikon] are themselves not very proficient in the language [English]. There are teachers teaching English in the vernacular, i.e., Xhosa, so students do not practise English and they are not prepared language wise. This is what keeps them back in their courses" [Individual interview 1].

This disadvantage and vernacular teaching of English may be inferred to account for the inadequate English HSLE that has an effect on the students' TLE levels.
Although the interviewee was reflecting on the instructional practices at his technikon, such vernacular teaching of English often has its source in deficient English HSLE.

A similar observation that linked L2 English HSLE instruction to poor schooling was also made in the telephone interview. When the respondent was asked to describe poor schooling as a factor of underpreparedness, she mentioned that:

> One of the biggest disadvantages is the background from school and home which is not highly literate and this makes it difficult with English levels and so

> they are unfamiliar with text type or acceptable writing practice and that stems from lack of literacy, lack of school resources and inadequately trained teachers [Telephone interview].

Although the interviewee linked L2 English impairment to both the school and home disadvantage situations, the severity of underpreparedness lay, for the interviewee, in the link between low home literacy and difficult English levels. This is an extrinsic or distal description of the SAU cognitive structure.

However, the interviewee's linking of poor English levels to inadequately trained teachers supports the view that low L2 English levels among "underprepared" first year technikon students reflect an inadequate HSLE second language input. This is an intrinsic or proximal description of the SAU cognitive structure.

The interviewee's linking of home support to L2 English impairment contrasts sharply with item 5 of the family background result that reported 42% of the breadwinners having some form of professional jobs.[25] It also contrasts with the item 8 result that indicated 42% of the respondents' academic helpers being mothers. The point is that the low literacy levels at the respondents' homes did not seem to impact more severely on their L2 English underpreparedness than the factor of poorly trained school teachers. It is at the school where the respondents would have spent most of their formal learning experience.

The next item, 9.1, linked English levels to "being able to follow what the teacher was saying". There were 74% respondents who indicated that they never understood the teacher when he/she used L2 English at the HSLE level. This observation is

[25] This score, as pointed out in chapter 3, may have resulted from respondents' misunderstanding of the question because, in fact, there is high unemployment, especially in the Eastern Cape and KwaZulu Natal.

significant because only 47% of the respondents stated IsiXhosa in item 24 as their home language (HL).

If, for example, the learning modes and procedures for past and future tense structures are impaired as a result of poor English L2 instructional input, that impairment could affect negatively other L2 acquisition processes such as using an active voice and agency in, for instance, written communication.

Another variable that contributes significantly to underpreparedness for technikon study, especially among students from township and rural public schools, is a tendency to fall back on the HSLE acquired rote or parrot learning (Nickerson, *et al.*, 1985:33; Bereiter and Scardamalia, 1985:65; Haiden, 2001:1). This works against their L2 empowerment and scientific conceptual grounding for academic and vocational excellence (Nickerson, *et al.*, 1985:33).

This discussion of the L2 English results implications is concluded with a juxtaposition of the respondents' HSLE English exposure and their descriptively advanced English technikon learning experience (TLE). Item 27(c) reports 33% of respondents who indicated that when a technikon lecturer uses L2 English in the classroom they do not understand and therefore find it difficult to ask questions.

In the case of item 28, 37% of respondents claimed that they did not find it easy doing the subject matter in English L2.

It can be postulated, without drawing any causal links between the respondents' poor HSLE of English L2 and the TLE of English, that a sub-normative HSLE English L2 accounts for the respondents' technikon classroom passivity. It is also, as reported in the individual interview 1, "one of the factors behind the students' struggle with basic course concepts. It often requires lecturers to scale down or simplify the concepts down to their most fundamental level [Individual interview 1]".

Since the concept of understanding borders between L2 acquisition and the cognitive and higher order thinking skills acquisition, and also since the study is loaded on the side of the latter concepts, it is best to examine understanding as a function of scientific concept acquisition.

5.5 IMPLICATION OF RESULTS FOR COGNITIVE AND HIGHER ORDER THINKING SKILLS

Item 15c asked the respondents to describe their technikon learning experience in terms of whether they struggle to catch up or catch up quickly. The responses suggested little difference along gender lines. There were 75.38% female respondents who indicated struggling to catch up with course work, and 73.77% males who indicated catching up quickly.

The struggle to catch up, according to Perkins (1985: 50-51), relates to encoding of thinking processes such as responding to lecture meaning cues, critical reading and classifying course concepts. The inability to encode information constitutes a failure to organise or structure the thought processes (Nickerson, *et al.* 1985:51).

While making a point that there are different types of student learning paradigms, Jensen (1989:41) also distinguishes between slow and fast learning where the former is generally preceded by the latter. Whereas fast learning is characterised by quickly "catching on," "getting the idea", "grasping a concept," or "restructuring already accumulated knowledge", slow learning facilitates a "deep baseline acquisition of proficiency" in, for example, reading, writing and numeracy skills (Jensen, 1989:41).

The results for item 16(a) on doing academic homework, along gender lines, without or through a systematic plan indicated that 93% of female respondents perform this task without a systematic plan. This, perhaps, explains why they have difficulty in catching up. That difficulty is also linked to an inability to deploy their task strategies spontaneously or automatically (Perkins, 1985:352).

In most cases the "underprepared" students fail to synergise their HSLE homework performance strategies with those they acquire in their TLE. The failure to retrieve these strategies is often related to difficulties with organising the cognitive coping strategies and foregrounding inert knowledge (Bereiter and Scardamalia, 1985:65-66).

The difficulty in applying cognitive strategies was also illustrated clearly in the telephone interview where the respondent alluded to the students' inability to apply what they have learnt. For example, in relation to whether "linear thinking skills were a problem area for her students", the respondent replied that

> I think there is a problem with that, especially the inability to apply what you have learnt. The educational background is responsible for rote learning, memorisation of facts, not questioning and waiting for someone to tell you what to do and what not to do which is clearly not the kind of approach expected at tertiary level [Telephone interview].

Obviously the lack of "capacity" or "ability" for "underprepared" students' application of their knowledge skills can be traced mostly from the factors identified by the respondents.

The conflict between spontaneous thinking processes in communitarian oral cultures and their linear, higher order and planned HE counterparts are some of the critical factors behind poor learning strategy development.

The classroom learning passivity mentioned earlier was also cited as a symptom of "underprepared" first year students' fear of making mistakes (individual interview 1). The respondent agreed that this problem is linked to students' fear of self exposure.

This fear of making mistakes is somehow also linked to passive acceptance of the disadvantage tag (Individual interview 1). That fear leads to situations where the students are afraid to make class contributions even in their Xhosa mother tongue.

Clearly, the failure of "underprepared" students to use their task strategies automatically requires an investment of mediated effort for modifying their learning behaviour from classroom passivity into proactive and self directed executive knowledge control (Sternberg, 1997:19).

The bipolar HAIs (technikon 2 and 4) data results for item 17a on learning motivation depicted 63% of the bipolar technikon respondents as well motivated. And 37% were accordingly not well motivated across both technikons. The latter would generally be the target of SAU reversal programmes.

Seligman (as quoted in Anderson & Jennings, 1980:393) argues that low cognitive motivational levels often result in performance decrements and academic failure. However, Anderson & Jennings (1980:393) contend that such failure can also create new expectations of success. Vernon (1969:122)[26] maintains that repeated failure can increase failure anxiety and lower the academic achievement motivation. Plausibly, low motivation has a potential for lowering the application of an on-task effort.

The executive knowledge control function will be discussed through an interpretation of item 11 and 17(b) results. Item 11, an open-ended question, asked the respondents: "Which strategies did you use to cope with your schoolwork (e.g., study time table)." The following five attributes were compiled from a wide range of responses:

1. Study time table
2. Task performance
3. Learning reinforcement
4. Cognitive operations
5. No strategy.

Task performance had the highest recurrence incidence more than any of the above attributes. The respondents identified it as consisting of two elements, i.e.,

[26] This text may be old but some its principles still have currency. It is treated here as a "classic" text on learning motivation.

"performing academic tasks long before the examinations" and "doing the tasks on time." Whereas the first element is an instrumental coping strategy for examination preparation, the latter is a time management control function. Both these elements reflected the respondents' attempt to match their task performance strategies to task demands (Pressley, Borkowski & Schneider, 1987:102). They also convey their implicit understanding that academic and vocational success is linked to their attainment of self-management ability (Sternberg, 1997:19).

Item 17(b) was an evidential question (Kuhn, 1991:3) that asked: "How do you know that you are a well motivated learner?" Figure 3.8 in the previous chapter grouped the range of responses into five attributes and sub-attributes. Three of these, i.e., self motivated (SM), academic effort (AE) and academic ability (AA), received high f_o scores of respectively 56 for SM, 26 for AE and 15 for AB.

The respondents attribute the SM evidence to the following sub-attributes:

1. Have a plan for academic work
2. I contribute to my technikon fees
3. I am a first generation HE student in my family
4. I am never discouraged by the workload
5. I am keen on learning

Although the SM > AE f_o score (> means greater than), the latter also had its own five sub-attributes:

1. I apply extra effort
2. I concentrate in class
3. I always (sic) make research
4. I consult lecturers
5. No effort

The AA attribute, despite its low score, also had five sub-attributes:

1. Work to the best of my ability
2. Enthusiastic/prepared for my work
3. Able to explain something I learn
4. Planning
5. Hand things on time

It is noteworthy that the planning sub-attribute features in both the SM and AA attributes. These sub-attributes form the "knowledge base" for general strategy user interface (Pressley *et al.* 1987:108).

The SM, AE and AA attributes and their sub-attributes can be considered to constitute an academic preparedness threshold. Although the SM and AE attributes are subjective and controllable intelligence factors, the AA constitutes a fixed or permanent monitoring standard for SM and AE competency levels assessment (Carrol, 1993:8-22; Nickerson *et al.*, 1985:8 and 349). The AA attribute needs further treatment as it contains the seed for an academic preparedness yardstick.

Although academic preparedness lies midway between SAU and expert or gifted multiple intelligent academic performance (Carrol, 1993:8; Ericsson and Charness, 1994:725-743;), this concept sums up the continuum for an AA performance standard. Nicholls (1978:80) first contends for an interdependency of the AA and AE concepts before he defines ability as entailing "...what a person can do, and evidence of optimum effort is required before we accept performance as indicative of ability." Thus, AE and academic strategy possession can be considered as lying midway between academic and vocational excellence.

It has also been suggested (Jensen, 1989:43) that the AA attribute is a function of "Level I and II abilities." Level I abilities involve the registration and recall of information involving little, if any, transformation of the input; Level II abilities involve transformation and mental manipulation of the input (Jensen, 1989:43). The concept of ability is definitive of academic preparedness in the sense that:

> To be termed an ability, the behaviour must meet two main criteria: (1) It must be an observable response to a task, a problem, or challenge offered by the environment; and (2) the adequacy of "goodness" of the response must be of such a nature to be classified or graded in terms of an objective standard (Jensen, 1989:46).

In order for an academic ability to be considered a goodness of fit for the promise of excellence, its efficacy should be proved in successful classroom and tutorial task performances. In the case of vocational ability, the fit of its excellence should relate to competency in specific job related skills.

Both academic and vocational excellence should lead to a student's/trainee's/ technician's ability to contribute to scientific development of his/her profession and community welfare.

Consequently, a longitudinally quantified and qualified AA notion would also constitute an objective standard against which the students' effort application and "spontaneous strategy use" can be evaluated (Borkowski, 1987:61-71). The AA notion is also dependent on a students' successful application of higher order thinking skills.

Metacognition is concerned with the functioning of the students' higher order thinking skills (Perkins, 1985: 101). These skills are useful for the acquisition, use and control of knowledge through the ability to plan and regulate the superior faculties for knowledge management. The latter has been termed "mental government" because of its executive control of knowledge production (Sternberg, 1979:19).

Another key thinking function that is required for successful executive knowledge control is the students' ability to activate their prior learning control. This is the metalearning function that enables students to be aware of their weak and strong thinking potentials (De Villiers, 1990:38). This function is necessary as a mediator between successful and poor academic performance. Consequently, the more students are aware of their learning difficulties (demands) and their own learning abilities (potential) the more they are able to match the task demands and their learning potential in enhancing their learning performance (De Villiers, 1990:39).

The discussion concludes with a consideration of the implications of the results for the learning support/development programmes characterising the institutional SAU responses.

5.6 IMPLICATION OF RESULTS FOR INSTITUTIONAL RESPONSES

These responses are discussed as part of the technikons' learning intervention (Adey and Shayer, 1994:38) and student academic preparedness facilitation. There was a 78% f_o score for the bridging programmes and a 72% f_o for extra lecturers, as a means of learning support for L2 English and cognitive academic proficiency acquisition. Both these variables are for item 32 across the sample. A 61% f_o score for item 31, a LS item, also indicated a cross sample respondents' preference for

supplemental instruction (SI) programme to be a peer driven learning support mechanism. This indication cuts across the HDI and HAI institutional labels. That response corroborates the TLE item 19 for the respondents' 63% f_o preference of discussing a problem with a friend first.

An interesting aspect of the institutional responses was the citing of external support in the form of, for example, the Desmond Tutu Educational Trust's (DTET's) funding and training programmes for AD staff. The DTET's work-study programme and tertiary educational linkages programme (TELP) were also cited (Focus group, Individual interview 2 and individual interview 3) as a means of empowering, respectively, the students with job related skills and staff with project management skills.

A programme such as the work-study was seen by staff not only as facilitating the faculty mainstreaming of learning support, but also as a means of incorporating the vocational experience into the 3 year diploma or the 4 year bachelor of technology learning programmes (individual interview 3). Such an intervention facilitates, in my view, the acquisition of Engelbrecht's vocational and career task matrix line items.

5.7 VOCATIONAL CONTEXT

The study contends that a successful reversal of SAU needs to be grounded firmly on the repositioning of second language, higher order thinking skills acquisition and institutional responses on Engelbrecht's values of vocational excellence. Such values are necessary not only for the students' technikon academic coping skills, but

also for their cooperative education and job speficic skills acquisition. The vocational context, in other words, lays the foundation for future career skills proficiency.

5.8 CONCLUSION

The discussion of the results suggests that the baseline survey data indicate that the majority of the respondents lacked the school national normative English L2 proficiency levels. Most of the respondents preferred to use their home language outside lectures and 38%in their study groups. They also gave indications of poor academic effort and task strategy spontaneous deployment potential. All these factors negatively affect their ability to perform in an academic situation. Concerted investment at the level of task effort and strategy stimulation, on the other hand, could lead to an achievement motivated performance and academic preparedness.

Academic preparedness attainment by "underprepared" learners seems to require HSLE behaviour modification for reversing their technikon classroom passivity. The attitude of fear of making mistakes during formal classroom learning is one of the key obstacles to the stimulation of, task effort and strategy application, for instance. This happens, as one of respondent's indicated, even in L1 IsiXhosa native speaker acquisition situations.

Technikon AD programmes have to design learning tasks that gradually alter learning passivity while stimulating incrementally proactive learning behaviour. Such interventions should lead to the attainment of Jensen's level II abilities that exemplify the academic, vocational and career skills listed in the task matrix.

Programmes like SI and workstudy present good opportunities for, peer learning modeling and trainee vocational skills acquisition that broaden an "underprepared" learner's frame of reference. Such programmes are useful not only for preparing learners to cope with technikon education, but also to make a contribution to their future professions as well as to community development.

CHAPTER 6

FINDINGS AND RECOMMENDATIONS FOR FUTURE RESEARCH

6.1 FINDINGS

The findings are divided into two parts. First, the core arguments from each of the five chapters are summarised. Next, the overall findings are presented in relation to the purpose of the study as set out in Chapter 1. The limitations of the study will be outlined and recommendations for future research will also be made. Finally, the ultimate importance of the study to capacity building is also stated.

6.1.1 Core arguments

The main purpose of Chapter 1 was to state the problem and establish its setting. Figure 1.1 of Chapter 1 listed ten terms that have been used to describe academically challenged students from the 1800s to the present times. "Underpreparedness" is one of those terms. Unlike deficit terms like "high risk", "non-traditional", for example, "underpreparedness" acknowledges prior student learning while simultaneously allowing for development of second language and higher order thinking or cognitive skills in relation to the particular demands of a specific academic situation.

Three student academic underpreparedness (SAU) subproblems were delineated. The first one described the main and adjunctive SAU components. These six main SAU characteristics will be restated here. For a full discussion of each of these

characteristics see 1.4 (Chapter 1). Also see point 1.5 of the same chapter for a detailed discussion of adjunct SAU variables. These variables are summarised below:

1. First generation students and underpreparedness
2. No career guidance and underpreparedness
3. Good matric results and underpreparedness
4. Discourse conflict and underpreparedness
5. Instructional shortcomings and underpreparedness
6. Cycle of failure and underpreparedness

Of these characteristics the last one, cycle of failure and underpreparedness, seems to be the one, after entrapping a student in the repetition of grades, that may condition that student to expect failure. These expectations result in poor self esteem, anxiety, repetitive failure and eventual technikon drop out (Savage, 1993; Moody, 1993) or what can be described as a self-fulfilling prophesy.

The second subproblem contended that technikon selection and admissions procedures make implicit assumptions of underpreparedness and preparedness. Four criteria were mentioned as underpinning HE or technikon selection processes: Only one of these, the promise of excellence, will be highlighted here because it defines the technikons' entrepreneurial pursuit of teaching and learning excellence (Kok *et al*, 1996).

The promise of vocational excellence defines a contract like relationship between a learner and a technikon. That promise is embedded in technikon selection processes. It encapsulates the technikons' own description as educational and entrepreneurial centres of excellence that give admission preference to students with a potential for academic success. The third subproblem problematised the technikon

responses to SAU by arguing that units such as those of AD should deal essentially with proximal (intrinsic) second language and thinking skills underpreparedness, whereas the "distal" (extrinsic) underpreparedness factors such as overcrowding at home, commuting between home and technikon, financial problems and others should be a responsibility of units like student services. However, open lines of communication and a synergistic working relationship between those intervention units needs to be established .

Chapter 2 reviewed the literature on technikon education, and second language and scientific conceptual skills acquisition. One emphasis of the review was on defining broader second language acquisition (SLA) within the context of classroom second language (English) development (SLD). Another emphasis was on the acquisition of scientific concepts or higher order thinking skills that are an intrinsic part of the development of academic literacy. This review provided a framework for the systematic study of underpreparedness which forms the core of the study.

Chapter 3 examined SLA and scientific concept acquisition from the perspective of contemporary literature. It presented an argument that technikon L2 English lecturers and academic development (AD) practitioners need to relate their English second language (ESL), English for academic purposes (EAP) and English for specific purposes (ESP) course materials to technical and vocational pedagogical norms. It was also found that a reversal of proximal or innate cognitive impairments could alter the underlying physiology of SAU as a precursor to learning modification.

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Learning modification involves the diversion of impairment stimuli so that a concerted investment of new learning behaviour modalities can be set in motion. It was also contended that the role of indigenous knowledge systems (IKS) should be acknowledged, especially as far as the learning experiences of learners from township and rural communities are concerned.

Chapter 4 dealt with the research design and the data that were obtained. It was noted that the research sample was biased towards female members, who constituted 75% of the respondents. The quantitative and qualitative findings suggested a probability of second language and scientific conceptual skills impairment being the major underlying SAU factors. As the data was described only through the tabulation of expected and observed frequencies, no causality between the dependent and independent variables was determined.

Since causality determination is a function of inferential statistics and correlational analysis (Babbie and Mouton, 2001), its use in interpreting the analysed data fell beyond the scope of the study. It can, however, be argued that the simple inference that there is a link between high levels of student home language (HL) use outside their classrooms and their second language acquisition (SLA) difficulties is of limited value.

Such an inference has to be based on rigorous contexualised exploration of involved factors, tendencies and intermediate and long-term results. The study has attempted to describe the effect of high levels of student home language use outside the classroom as related to problems experienced in the tertiary classroom.

Chapter 5 discussed the findings of data presented in Chapter 4. The analysis of student questionnaire responses showed that there is a strong probability that second language and cognitive variables constitute the major underpreparedness variables within the confines of this study. It is important to note that this finding remains valid only within the parameters of this triangulated quantitative and qualitative descriptive survey. In other words the SLA and higher order thinking skills findings can be generalised non inferentially within a descriptive survey method.

The qualitative analysis of staff interviews revealed that SAU is indeed a major technikon academic policy and faculty challenge. Most of the interviewees suggested that the highest proportion of "underprepared" students are in the first year technikon student intake. The majority of those students come from rural and township school backgrounds where it is often true that some under-trained teachers teach English through IsiXhosa or IsiZulu mother tongue. As a result, these students struggle to cope with basic technikon academic tasks such as lecture note taking, asking lecture related questions and others that require competencies in English.

Clearly, the students' impaired potential for deploying English L2 skills can plausibly be said to affect their thinking skills in that their lack of basic vocabulary for course concepts can frustrate their metalearning skills and executive knowledge control functions (De Villiers, 1990 & Sternberg, 1997).

As mentioned earlier, one HDI interviewee suggested that "underprepared" students have a common trait, fear of making mistakes, especially in linguistically and racially

diverse classroom situations. In the experience of the researcher, this fear is prevalent in historically advantaged institutions (HAIs) or multicultural campuses where the "underprepared" students engage in “uneven” classroom competitive performance with the English L1 native speakers and users.

6.1.2 Overall findings

Five overall findings can be described as factors that plausibly underlie the transformation of first year students from underpreparedness to vocational preparedness and excellence:

- Concerted classroom investment in stimulating the students' task effort exertion.
- Assisting students' to self-monitor and apply their school task strategies to technikon learning tasks.
- Simultaneous redress of historical disadvantage and reversal of proximal second language and scientific concept impairment at input level.
- Recognising the academic ability concept as an academic performance benchmark to be made explicit to the students especially in extra lectures and academic development programmes.
- The goal of underpreparedness reversal is student acquisition of proficiency in vocationally inclined second language and higher order thinking skills.

These variables are treated in detail in the next discussion in order to highlight their specific SAU amplifying features.

6.1.2.1 Classroom investment in stimulating task effort

Feuerstein (1991) contends that a concerted investment in stimulating a learner's class effort accounts for substantive returns in efficacious learning improvement. Such an improvement leads to the attainment of level I and II abilities. Those abilities often consist of a cluster of immutable unit performance standards that reflect the

amount of effort a learner exerts in processing the learning stimulus inputs, such as apprehending, encoding, storing, organising, retrieving data (Jensen, 1989:40-41).

These abilities are now briefly described. Level I abilities consist of registration and recall of information involving little, if any, transformation of the input; those of level II involve transformation and mental (thinking skills) manipulation of the input (Jensen, 1989:41). Students have to be encouraged to self monitor their transition from level I to II abilities until they are able to learn and perform tasks extremely quickly, virtually automatically and with little conscious effort (Jensen, 1989:41).

6.1.2.2 Cognitive and linguistic bridging

The notion of cognitive bridging is defined by Perkins (1986:211-22) as a multi-layered process consisting of bridging from information to design, from teacher to students, from subject to subject and from context to context. An example here is the empowerment of students with project interactive interviewing skills for community needs analysis. Supposing that the Cape Town Municipality wants to find ways of discouraging informal settlement communities from using primus stoves for heating during winter because the latter are a major cause of conflagrations.

Most of the students from informal settlements and townships would be familiar with the problem and probably also have an immediate identification with the municipality's concern. However, in assisting the municipality to conduct such a survey, such students would need to be grounded in project research interview skills before they commence their work.

The first task in training those students would be to discuss the strategies for primary and secondary data collection; have a classroom role-play of interviewer/interviewee relationships and encourage classroom participative design of a prototype interview instrument. To gain proficiency in those skills, the students will have to be encouraged to use those skills in other courses as well as in their community social activities. Such a process would not only train students on project interviewing skills, but it could also broaden their ecological, economic and social frame of reference, especially in the case of those students who are unfamiliar with life in the informal settlements. The project could also act as a stimulator of classroom use of the students' "everyday" knowledge repertoire as a means of transition from the familiar to the unfamiliar problem solving strategy application.

The ultimate goal of a bridging process is, therefore, to facilitate a design type of knowledge that continually improves itself and eventually becomes self-sustaining. Successful transition of a student across the above bridging phases requires him/her to have a bird's eye view of the units of knowledge enabling him/her to design the necessary executive knowledge management strategies (Sternberg, 1997:

Executive knowledge control is a prerequisite for the acquisition of Engelbrecht's self-management task matrix ability. This ability can be demonstrated in a learner's successful control of transition from scholastic to technikon task strategy execution. That control enables learners to distinguish between general and significant outcomes of their knowledge production experiences (Spady, 1994: 49).

It is also necessary to match competency in executive knowledge control with second language proficiency. However, in the case of "underprepared" students from rural and township oral cultural backgrounds, the acquisition of L2 discourse always contends with cyclical or repetitive features of the home language or mother tongue discourse.

Those students who manage to acquire an aspect such as, for example, subject/object argumentation skills in one L2 lesson, soon find those skills being challenged outside the classroom by mother tongue discourse which sometimes blurs those subject/object discourse features. Many "underprepared" students, in my experience, tend to fall back, during classroom L2 acquisition, on their familiar mother tongue discourse strategies. That fall back sometimes leads to their loss of classroom L2 acquisitional gains.

It can be surmised, therefore, that for every classroom SLA discourse increment there is an extra classroom SLA decremental challenge by mother tongue discourse. However, some mother tongue discourse features, such as those of oral rhetorics, could be used beneficially in L2 spoken speech improvement.

Gough's (2000) suggestion of the notion of interdiscourse, as mentioned in chapters 2 and 3, could also bridge this gap between oral and linear linguistic discourse relationships. However, that suggestion does not address the bridging of thinking skills. Here it may be necessary to integrate into the curriculum two of the most important generic skills, viz thinking and second language competency, where students often need additional development. Ideally this should spill over into the

residence learning structures where students often have to solve problems and discuss work in the medium of instruction and using thinking skills. The ideal would be to create specially monitored technikon campus and residence linguistic environments where thinking "wellness or learn to think and think to learn skills" can be nurtured and developed (Botha, Cilliers & du Plessis, 2000).

6.1.2.3 Social redress and proximal L2 impairment

It is necessary for any underpreparedness reversal process to address the problems of academic disadvantage and second language and scientific skills impairment simultaneously. Although that intervention needs to be effected separately and sometimes in parallel streams, open lines of communication need to be maintained between those two forms of intervention.

Although the non-academic technikon units like student counselling, student affairs and student fees deal with social, psychological and economic redress, the academic development units and faculties have major responsibility for reversing proximal underpreparedness in that they offer structured instructional credit or non credit bearing AD programmes.

6.1.2.4 Performance benchmarking

Academic ability needs to be recognised as a performance benchmark to be made explicit and developed through, for instance, extra lectures, bridging/foundation programmes, SI, writing centres, EAP, ESL and other academic development interventions. Both level I and II abilities have to be clearly defined and made explicit

in course materials and in task reduced and context embedded lecture and coursework requirements (Cummins, 2000:55).

6.1.2.5 Second language and thinking skills

The goal of technikon learning, as the Engelbrecht matrix suggests, is the acquisition of academic and vocational or instrumentational industry job specific skills. Thus, underpreparedness intervention in the form of second language and thinking skills impairment reversal should, as argued in Chapter 3, aim at developing course materials that incorporate the vocational or job specific skills proficiencies. Courses such as English for academic purposes (EAP), English for specific purposes (ESP) and English second language (ESL) need to incorporate the learning strategies of cooperative education and the instrumentational components of L2 and thinking skills proficiency.

6.1.2 Synthesis of findings

Within a descriptive survey perspective, the core arguments and overall findings confirmed the usefulness of the underpreparedness concept as a tool for identifying student academic performance problems.

6.2 LIMITATIONS OF THE STUDY

Although the research proposal included the design of an academic underpreparedness indicator (AUI), which would be based on the results and findings, that aim was abandoned because it requires rigorous data analysis of

student performance at school and technikon level. This, then, lay beyond the confines of the study.

The limitations of the study fall into two categories: (1) those falling within the control of the researcher and (2) those falling beyond the researcher's control.

6.2.1 Limitations within the control of the researcher

One limitation could be described as being within the control of the researcher:

- The descriptive survey method that does not allow generalisation of the results and findings beyond the confines of the study.

Although the sample size was not large it was, however, able to furnish, within the constraints of limited resources, the kind of data that was required by the study. It was the researcher's deliberate intention to limit the empirical methodology to describing SAU in the light of technikon first year and bridging learners' and lecturers' perception of it. Its findings, however, offer insights into the study's *universum*.

6.2.2 Limitations beyond the control of the researcher

Two limitations were beyond the control of the researcher:

- Lack of cooperation from some of the technikons
- Female gender bias of the sample

The *universum* of the study's population had to be reduced and limited to technikons in Eastern Cape, KwaZulu Natal and the Western Cape not only because of insufficient study funding, but also because other technikons approached for

permission to do the study were unwilling to allow data to be gathered. A sample of 'convenience" was therefore made. The gender profiles of the sample were also a factor that lay beyond the researcher's control. Hence, the high number of female student sample members reflects the selection criteria that was applied independently by the institutional contact persons. Financial and other constraints did not make it possible for the researcher to gather data personally.

6.3 RECOMMENDATIONS FOR FUTURE RESEARCH

On the basis of the study's results and findings, the following methodological and operational recommendations are made:

- Triangulation should also include participant observation of SAU programmes, case studies and in depth student and staff interviews.
- A longitudinal study of underpreparedness, especially targeting a larger first year group, for rigorous documentation, testing and control for designing an academic preparedness indicator.
- Examining the causal link between effort and strategy in the attainment of explicit academic performance ability/abilities.
- Investigating the role of indigenous knowledge systems (IKS), especially the L1 oral literacy and cultural mediation, in facilitating vocational knowledge acquisition.
- Acknowledge the disadvantage/advantage variables and need for their redress, but proceed to reformulate SAU proximally or intrinsically in terms of the academic underachievement norm.
- The incorporation of inferential and correlational techniques in order to explore policy and faculty impacting strategies

6.3.1 Research design and sample size

It is necessary for any future similar study to transcend the descriptive method and incorporate inferential and predictive quantitative techniques. Such a transcendence can overcome the nominality and marginality inherent in frequency distributions. A

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broadened research design can plausibly yield results that reflect and impact on technikon academic policy and practice.

The sample size also has to be broadened to include technikons in other provinces. This can be useful for enlarging the L1 or mother tongue linguistic diversity so as to enable a wider comparative analysis of L2 technical English skills impairment. Such a comparison can take place multi-ethnically, multilingually and cross culturally between, for example, Nguni (KwaZulu Natal or the Cape) and Sotho (Northern Gauteng) speaking students. This is important because technikons like Mangosuthu and Border in the sample are predominantly Nguni institutions. It may even be necessary to compare the role of ethnic influence and "ukukhumtsha" on, for example, L2 underpreparedness across the disadvantaged and advantaged technikons.

6.3.2 Methodological triangulation

The research design and sample will also need to broaden methodological triangulation to include participant observation, in depth interviews, case studies and staff questionnaire administration. Such a multiplicity of methodological tools could facilitate the observation and analysis of the problem from a long-range data perspective. The researcher's contention is that the more comprehensive the research methodology, the more substantive the data quality.

6.3.3 Longitudinal research

With regard to suggestions about inferential statistics in 6.3.1 above, a long term research duration will be necessary to obtain more extensive results and findings. This could include new programme design, implementation, evaluation and academic and curriculum policy review processes. This would make it possible to explore the efficacy and usefulness of strategies used in reversing underpreparedness.

A longitudinal sample frame can also allow for the development of learning potential assessment and cognitive training test batteries to assess, for example, the domain specific learning competencies in the students' transition from school to technikons (Minnaert, 2002:335; Ghesquiere, 2002:385-387).

6.3.4 Effort and strategy

It is necessary to conduct a more rigorous investigation of the links between academic effort and strategy in student performance in the context of study at a technikon. Such an investigation should provide insights into the links between course materials and lecture content information, especially for first year and bridging students.

6.3.5 IKS and vocational skills acquisition

There is also a need to investigate the relationship between indigenous knowledge systems and vocational skills acquisition, especially in the light of the Engelbrecht

matrix. Such an investigation should focus on the possibility of accrediting and incorporating indigenous knowledge systems into the vocational technikon curricula. The goal here should be the validation of the IKS communitarian, oral and culturally mediating scientific methodology.

6.3.6 Underachievement norm

It is also necessary to realise that "underprepared" students are placed in academic corrective programmes because of their failure to obtain good scores in some classroom tasks. Within such a programme, it is important to take a hositic approach. The critical need, for instance, is to recognise the link between underachievement and affective motivational components. This has obvious implications for strategies aimed at stimulating cognitive performance improvement.

It would be untenable to draw a simplistic link between cognitive capacity stimulation and short-range or single-lesson based objectives (Ridge, 1996:15). It is also vital to create links between the students' prior knowledge and newly presented knowledge (Andrade and Perkins, 1998:72).

Underachievement is itself a factor of underpreparedness. The latter is a global indicator of academic impairment that is often based on pre-technikon entry selection results. It is important therefore that underachievement factors are not only used to pinpoint student shortcomings, but that they are also used to identify the unit standards of academic performance whose attainment would set the students on a path to academic success.

6.4 SUMMARY

The study was conducted to establish some baseline descriptive data to illuminate the problem of first year student underpreparedness through a consideration of second language English, cognitive and institutional response variables. Another objective was to consider the role of concepts like disadvantage and advantage in SAU. Such disadvantage factors include, among others, home overcrowding, commuting distance between home and campus, lack of home study facilities, first generation technikon student, home radio/television high noise levels.

The fact that these concepts were found to be distal or extrinsic to an impaired cognitive structure, means that the lecturing and academic development staff should focus on correcting the proximal or intrinsic properties, while the extrinsic features are dealt with through student finance and counselling services. Close collaboration will still have to be maintained between these intervention streams.

The development of a first year "academic preparedness indicator" (API) that incorporates a range of ability taxonomies relating to effort and strategy in, *inter alia*, reading, writing, lecture note taking and group discussion requires rigorous testing, sufficient time and financial resources. It also has to be conducted longitudinally like Yeld's Placement test in English for educational purposes (PTEEP) which has been developing continually, at the University of Cape Town, since the early 90's (University of Cape Town, 2000). The challenge is to relate such tests to the vocational and career goals of a student, the technikon and industry.

It should, however, be emphasised that there is a difference between the academic underpreparedness indicator (AUI) and academic preparedness indicator (API). The former could be used during technikon placement and selection processes, and the latter could be a performance benchmark that defines minimum course proficiency requirements. Both these indicators could have a mutual and back-to-back academic and vocational performance assessment and ability reinforcing relationship.

Another challenge is to develop an AUI and API for numeracy, mathematical and technological skills in science and engineering disciplines (Miller & Bradbury, 1998: 103-104). Such an indicator could explicitise the basic skills that are required in science and engineering career and vocational excellence.

6.5 ULTIMATE IMPORTANCE OF THIS STUDY IN RELATION TO CAPACITY BUILDING IN SA

This study contributes to a body of research studies that probe the causes of failure and drop-out of "underprepared" HE students. Its major emphasis is that the proximal (intrinsic) underpreparedness factors such as second language and thinking skills impairment account for a substantial proportion of SAU. Concerted stimulation of learning skills is a necessary precursor to the holistic learning skills development. The recognition and accreditation of prior knowledge or IKS can also be another means of encouraging metacritical student learning.

A critical distinction must be made between learning capacity stimulation and academic ability or competency. It is necessary that the learning capacity stimulating programmes and cooperative education should incorporate the vocational and career proficiency instrumentation task matrix items in Chapter 3. The ultimate goal

of capacity stimulation is the attainment of L2 and thinking skills proficiency through the "underprepared" students' concerted task effort and strategy implementation.

The attainment of acceptable higher education proficiency levels by "underprepared" students facilitates their removal from "at risk" or "non traditional" tags that mark them as destined for course failure, unsuccessful career paths and technikon drop-outs.

A major yardstick for successful "underpreparedness" reversal is determined by whether an intervention programme is able to help a student learn and apply his/her knowledge skills independently of an intervener or mediator. This is critical because the students' careers in industry require them to demonstrate the "ability" to self manage themselves within their working teams as well as be leadership role models who can contribute to the advancement of their professional careers and community welfare.

APPENDIX A

Academic Development: Teaching and Learning Centre
Cape Technikon
Box 652
Cape Town
8000

2 March 2000

Att:
Director:Academic Support/Development Programme
Technikon

Dear Sir/Madam

DATA GATHERING

Sometime in I998 I requested permission to conduct a data gathering process for my doctoral study on "Student Academic Underpreparedness at Some Selected Technikons in SA." I received your letter of 29/10/98 advising me to contact .....will assist me with student selection. You also requested a copy of the questionnaire to be submitted to Prof ..... I was however unable to respond immediately to your letter because of some preliminary planning work which delayed my completion of the data gathering instruments.

Now that a set of questionnaires for, respectively, staff and students has been completed, I would like to request you to suggest two days in the 4th week of May this year for my visit to your campus to gather the data. I have attached a return form which will facilitate an easy administrative process between yourselves and myself and two copies, I each, of the questionnaires. The procedure for completing them would be as follows: staff and students would have to take them home on the first day and return them the next day for my collection. I will then request a group of three randomly selected students with whom I can conduct a structured group interview of about *1* hour which will lead to a design of case studies. One lecturer and I support staff member will suffice for the interview.

I'd be glad if you could possibly arrange 100 students from any of your bridging support /development programme and 50 second year students for questionnaire completion.

Thank you for your kind assistance.

Sincerely.

Sipho Nakasa
Head: Language Unit Writing Centre

APPENDIX B

QUESTIONNAIRE ON STUDENT LEARNING

INSTRUCTIONS

- *Please answer the questions below by making a cross (X) in the applicable number box.*

  Mark only ONE box per question, except where otherwise stated.
- *Dotted lines mean that you need to WRITE your answer.*

GENERAL INFORMATION

Name of technikon: .....

Faculty: .....

Year of study: .....

Gender:

Male	1
Female	2

FAMILY BACKGROUND

What kind of work does the breadwinner in your family do?

Works in a factory	1
Has a professional job (e.g. teacher)	2
Is self-employed (e.g. having a private business)	3
Is unemployed	4
Other (Please specify: .....)	5

Are you the first person in your family to study at a technikon (or university)?

Yes	1
No	2

HIGH SCHOOL LEARNING EXPERIENCE

Which ONE of the following persons helped you the MOST with your high school studies?

Mother	1
Father	2
Brother	3
Sister	4
Friend	5
Other (Please specify: .....)	6

In which way(s) did the person in Question 7 help you?

.....

.....

.....

How often did your teachers at high school use English as the medium of instruction (teaching of language subjects excluded)?

Never	1
Sometimes	2
All the time	3

10. Which of the following learning facilities did your high school have? (*Please mark ALL that apply.)*

Computer centre	1
Tutorial service	2
Language laboratory	3
Extra classes	4

11. Which strategies did you use to cope with your schoolwork (e.g. a study time table)?

.....

.....

.....

12. On a scale of 1 to 5, how do you rate your high school learning experience in terms of each of the following sets of attributes? (*For EACH of a, b and c, please mark the number that BEST represents your high school learning experience.*)

(a)	Boring	1	2	3	4	5	Exciting
(b)	Difficult	1	2	3	4	5	Easy
(c)	Unpleasant	1	2	3	4	5	Pleasant

13. What was your average symbol for your senior certificate?

A	1
B	2
C	3
D	4
E	5

14. Did you obtain a matriculation exemption?

Yes	1
No	2

TECHNIKON LEARNING EXPERIENCE

15. Where do you stay while studying at technikon?

Home	1
Technikon residence	2
Sharing accommodation with a friend	3
Communal accommodation (3 or more people)	4
Board and lodging at a private residence	5
Own residence	6
Other (Please specify: .....)	7

16. On a scale of 1 to 5, to which extent is each of the following descriptive of your learning experience at technikon? (*For EACH of a, b and c, please mark the number that BEST represents your learning experience.*)

(a)	Need support	1	2	3	4	5	Need no support
(b)	No hard worker	1	2	3	4	5	Hard worker
(c)	Struggle to catch up	1	2	3	4	5	Catch up quickly

17. If you are given academic homework, how do you go about doing it? (*For EACH of a, b and c, please mark on the 5-point rating scale the number that BEST represents your approach.*)

(a)	No systematic plan	1	2	3	4	5	Use a systematic plan
(b)	Do it alone	1	2	3	4	5	Do it in a group
(c)	Use minimum effort	1	2	3	4	5	Do it to the best of your ability

18. (a) Would you say that you are a well-motivated learner?

Yes	1	*{Go to Question 18(b)}*
No	2	*{Go to Question 19}*

(b) If yes to Question 18(a), how do you know that you are a well-motivated learner?

.....

.....

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19. Please indicate your extent of agreement (or disagreement) with the following statement: "I am unable to learn effectively when under pressure".

Strongly agree	1
Agree	2
Unsure	3
Disagree	4
Strongly disagree	5

20. If a subject-related problem is difficult to solve on your own, what do you do?

Discuss it with a friend	1
Discuss it with a lecturer	2
Visit a campus learning support person (Please specify: .....)	3

21. Where do you prefer studying?

At the library	1
In your room or study	2
Other (Please specify: .....)	3

22. How do you prefer studying?

Alone	1
With a friend or classmate	2
In a study group	3

23. On a scale of 1 to 5, how would you rate your study habits? (*Mark the number that BEST characterises your study habits.*)

Poor	1	2	3	4	5	Excellent

LANGUAGE AND COMMUNICATION

24. What is your home language? (*Mark ONLY one.*)

Afrikaans	1
English	2
Sepedi	3
Sesotho	4
Seswati	5
Setswana	6

Sindebele	7
TshiVenda	8
Xhosa	9
Xitsonga	10
Zulu	11

25. How often do you use your home language in EACH of the following instances?

	Never	Almost never	Occasionally	Very often	Always
(a) At your technikon during lectures	1	2	3	4	5
(b) With friends and classmates outside class	1	2	3	4	5
(c) In your study group	1	2	3	4	5
(d) With speakers of your own language	1	2	3	4	5
(e) At the place where you live during term time	1	2	3	4	5

26, Which language is the official learning language of your technikon?

English	1
Afrikaans	2
Other (Please specify: .....)	3

Only learners whose home language is NOT the official learning language of the technikon must answer Questions 27 (a), (b) and (c). If your home language is the official technikon learning language, please go to Question 28.

27. (a) How often do your lecturers explain the subject material in your own language?

Never	1
Almost never	2
Sometimes	3
Very often	4
Always	5

(b) When do your lecturers explain the subject material in your own language?

Only when asked by students	1
During office consultations	2
Not applicable because they never do	3

(c) If you do not understand something in class, do you find it easy to ask questions in the language of instruction?

Yes	1
No	2

28. On a scale of 1 to 5, how successful are you at solving problems using the official language of instruction?

Unsuccessful	1	2	3	4	5	Successful

LEARNING SUPPORT

29. Please indicate your extent of agreement (or disagreement) with the following statement: "Lecturers at the technikon are always willing to assist students who are struggling academically".

Strongly disagree	1
Disagree	2
Unsure	3
Agree	4
Strongly agree	5

30. (a) Does your course department at the technikon have a support programme for academically struggling students?

Yes	1	*{Go to Question 30(b)}*
No	2	*{Go to Question 31}*

(b) If yes to Question 30(a), please specify the support programme.

.....

.....

31. For EACH of the following learning support structures, please indicate whether or not it is available at your technikon.

	Yes	No
Bridging courses	1	2
Extra lectures	1	2
Foundation courses	1	2
Self-initiated group discussions	1	2
Student counselling service	1	2
Tutorial programmes	1	2
Writing centre	1	2
Other (Please specify: .....)	1	2

32. Which learning support structure were you orientated to upon arrival at your technikon? (*Please mark ALL that apply.*)

Bridging courses	1
Extra lectures	2
Foundation courses	3
Self-initiated group discussions	4
Student counselling service	5
Tutorial programmes	6
Writing centre	7
Other (Please specify: .....)	8

33. On a scale of 1 to 5, how often do you make use of your technikon's learning support structures when experiencing an academic problem? (*Mark the number that BEST represents your usage.*)

Never	1	2	3	4	5	Always

THE END

THANK YOU VERY MUCH FOR YOUR CO-OPERATION!
SEMI STRUCTURED INTERVIEW QUESTIONS FOR FACULTY AND ACADEMIC SUPPORT/DEVELOPMENT STAFF PERCEPTIONS OF STUDENT ACADEMIC UNDERPREPAREDNESS

APPENDIX C

DATA SCORING SPREADSHEETS

Variables	Factors	Subfactors
Learning support/mediation	**General support**	Mother always there to support me
		Father always there to support me
		Brother always there to support me
		Sister always there to support me
		Uncle, grandfather etc, always there to support me
	Financial support	Mother paid my school fees
		Father paid my school fees
		Brother paid my school fees
		Sister paid my school fees
		Grandfather, mother etc paid my sch fees
	Academic help	Mother brainstormed ideas with me
		Father, a former school teacher, helped with studies
		Brother choosing my subjects
		Sister translating my work
		Friend wanted us to compete
	Moral support	Father encourages me
		Brother encouraged me
		Sister studied with me
		Friend taught me the part I don't know
		Other, e.g. teacher guided me
	Self management	Mother helped me to be organised
		Father helped with research and management
		Jesus gives me strength
School work coping strategies	**Study time table**	Time used for weekends
		Fixed time (hourly) study
		Time management: less time with friends
	Task performance	Learn long before exams
		Doing it on time
	Learning reinforcement	Group study
		Extra classes

		Work hard
		Study alone
		Study at hostel
		Went to library
	Cognitive formal operations	Writing notes and summaries
		Revision
		Prioritising assignments in terms of importance
		Mind mapping
		Scan my work
		Writing centre strategies
		Listening and asking questions in class
		Keywords and float charts used
	No strategies	Took each day as it comes
		Cram the night before exams
Technikon learning experience	**Academic ability**	Work to the best of my ability
		Enthusiastic and prepared for my work
		Able to explain something I learn
		Planning
		Hand things on time
	Academic effort	I apply an extra effort
		I concentrate in class
		Always make research
		Consult lecturers
	Self motivated	I have a plan for the future
		I contribute to my technikon fees
		First generation HE student in my family
		Never discouraged by the workload
		Keen on learning
	Instrumental learning	Study to get good marks
		I have a graduate role model
		I want to have my diploma
	Not motivated	I work day before exams
		I try
		I do my work when I have to
		I can't cope with too much pressure
Reasons for library study preference	**Environmental reasons**	It is quiet there
		Serene there

	Information availability	Lots of books there
		Do research there
		Referencing
	No place to study at home	No study space in mother's shack
		Noise at home
	I concentrate there than in my room	Lots of noise where I stay
		I learn well there
	Do not study in library	
Support programmes	**Life skills**	Supplemental instruction
		Tutorials
		Lecturer support
		Mentoring skills
	Bridging	Academic development centre
		Academic support programme
		Academic literacy
		Extra classes
		Tertiary foundations course
		English for academic purposes
		Computer assisted language learning
	Auxiliary services	Writing centre
		Student counselling
	Student centre	Student representative council
		Youth movement for Christian action
		Bursary office

APPENDIX D

STAFF INTERVIEW QUESTION SHEET

TIME: 45 MINS

INSTRUCTIONS

- Should you choose not to answer a specific question, please indicate that preference
- Information gathered from the interview will not be used in any manner other than for the purposes of this study
- The QUESTIONS below will serve as a guide rather than restrict the free-flowing conversational mood of the interview
- The interview is anonymous

1. INTRODUCTION

1.1. Interviewer introduces himself (Names, Job and Functions and Employing Institution)

1.2. Intreviewee introduces himself/herself (Names, Job and Functions and Employing Institution)

2. PURPOSE OF INTERVIEW

2.1. Why this Interview?

2.2. Any specific objections/questions you would like to raise about this interview?

3. ADMISSIONS' POLICY

3.1. What is your Technikon's admission's policy?

3.2. Does this policy, in your view, cater sufficiently for the needs of Academically Underprepared Students?

4. CULTURAL DEPRIVATION

3.2. Do cultural deprivation factors like low income background, poor life skills, commuting to and from the Technikon contribute significantly to an Underprepared Students' poor academic performance?

3.2.1. What do you think would be the best method of undoing the above factors?

4.1.3. How, if at all, do you deal with students who have the above type of problems?

5. COGNITIVE DEPRIVATION

5.1. Does poor schooling constitute the MAJOR determinant of Student Academic Underpreparedness (SAU)?

5.1.1 How do you describe the symptoms of poor schooling?

5.2. What role should parents, peers and Technikon instructors play, in your view, in assisting SAUs perform better in their academic courses at your Technikon?

5.2.1. What role do you play or would like to see yourself playing in undoing SAU?

6. LANGUAGE POLICY

6.1. Does the language policy of your Technikon accommodate the needs of Academically Underprepared Students?

6.1.1. How exactly does this happen, if it indeed happens?

7. ACADEMIC SUPPORT/DEVELOPMENT

7.1. How do you think the Faculty and Academic Support/Development Staff can work together to develop effective strategies for helping AUS cope with Technikon learning and social adaptation challenges

7.2. Should attendance of Academic Support/Development programmes be made compulsory for AUS?

8. RECOMMENDATIONS

8.1. Are there ANY specific recommendations you would like to make regarding strategies for developing the potential of AUS?

9. CONCLUSION

THANK YOU VERY MUCH FOR YOUR KIND ASSISTANCE WITH THIS DATA GATHERING EXERCISE

APPENDIX E

INTERVIEW TRANSCRIPTS

SEMI STRUCTURED INTERVIEWS TRANSCRIPTION SHEET

Interviewee: Academic Development Officer, Technikon....

Duration: 45 minutes

SN: Introduction and explanation of the whole interview exercise.

LS: My title is academic development officer responsible for

- Teaching improvement and helping students.
- Curriculum development for teacher training, student support, e.g., bridging, SI and life skills.

General

SN: Which schooling backgrounds do your students come from?
LS: From rural backgrounds and 1% white (model c schools) and few Botswana students.
SN: Are they predominantly Xhosa speaking?
LS: Yes.
SN: Do you consider them as having been sufficiently prepared by the schools for HE?
LS: No. 40% of them the schools they came from had no libraries. They entered a library for the first time here [BT]. They rely on rote learning and they have severe English problems which is 40% below the national norm of English second language.
SN: Can you mention two things these students are unable to do?
LS: No note taking skills. If the lecturer is talking they can't take down notes. When they don't understand they are too shy to ask. Some approach lecturers if they don't understand.
SN: What is the cause of this shyness?
LS: This wasn't part of their school culture, i.e., discussion was not encouraged.
SN: Is the home playing a vital role in learning support?
LS: Yes. If parents encourage you, studying is seen as a priority at home and television should not be so loud a priority, then they can study effectively.
SN: Is economic and illiteracy factors a cause of this shyness?

LS: I cannot say there is a direct link between these two. I know that many of them come from difficult economic backgrounds, they make do with R150.00 a month for food and everything and so they cannot buy a note book and they will share a note book.

ADMISSIONS

SN: What is your academic support program?
LS: It varies from departments to departments but D is the common matric requirement.
SN: What kind of ASPs are linked to AP?
LS: No direct link but we have a tertiary foundation course for maths and science. We do have a programme for those who want to enter a secretarial office administration programme, they enter a four year instead of a 3 year programme.
SN: Is the matric symbol reliable for admission assessment?
LS: Yes, especially in the absence of something better. This is especially the case for maths.

HDI

SN: How do you describe the institution?
LS: As an HDI.
SN: Why?
LS: Because we were initially the Ciskei Technikon and our students came from there.
SN: How are your facilities?
LS: I think we are doing well on the facilities especially because the technikon was started in 1988. As there has been HDI redress, we have benefited from govt funding than HAIs.
SN: Are you becoming empowered?
LS: Technologically yes, but we don't have the organizational structure of support services.
SN: What are the highlights of your AD programme?
LS: Our major AD programme is SI and it is one of the strongest in the country. Life skills covers study skills, personal achievement, relationships and finance management. The other side is teacher development in the form of OBE [outcomes based education] implementation and in first year SI integrated programme is being pioneered.

AD and faculties

SN: What is the relation between your unit and faculties?
LS: I offer life skills to all departments as a course. I advertise SI at the end of the year. I check the low pass rate subjects and advise them [lecturers] to enlist with the programme.
SN: How many faculties do you have?
LS: We have two.

External support

SN: Is there any external funding?
LS: We have TELP funding helping us look at language support, basic study skills, literacy and computer literacy.
SN: What is TELP?
LS: TELP is sponsored by USAID [inaudible] ten year support grants limited to HDIs.
SN: Do technikons collaborate as technikons?
LS: No, but there is government pressure for that to happen.
SN: Is the TELP language programme aimed at addressing the SAU?
LS: Yes! You have to deal with the most basic things like can a student speak in the language of instruction, can he access information on the computer, can you function with the computer – these are important for alleviating the difficulties.

Pass and failure rate

SN: Do you see the difference between pass and fail as sending a message about underpreparedness or preparedness?
LS: It is one important factor but there is also the possibility of them not being taught properly and so we have to focus on both teaching and study skills. As soon as you see there is a low pass rate then you know you have to look at the difficulty of the subject, the quality of teaching and the students' ability to cope which may be academically rooted or there may be personal problems if the student is dealing with significant personal problems but does not have the ability to concentrate on subjects even if he may be academically adequate. There are a number of factors to look at.

AD policy

SN: Is there an institutional policy on academic underpreparedness?
LS: There is no formal academic policy. Each year I look at the exams and highlight low pass rate subjects and look at that over the past 3 years and work on it through SI and

help with teaching skills improvement. I am at the beginning of developing a bridging policy for the whole institution.

Conclusion

SN: What are you personal dreams?
LS: My belief is that you have to teach the whole person and an education system that provides knowledge is failing in its task.

INTERVIEW TRANSCRIPTION SHEET 2

Interviewee: Lecturer in Art Technology, Technikon...
Duration: 10 Minutes

S : What specific academic skills do you teach your students?
N: Teaching note taking because students have a problem with intonation and they also have a problem with understanding. For them to cope at HE there must be AD. We also had the same programme at Fort Hare. Things like referencing and quoting are often lacking in students. The course also does not bridge the gap between school abnd technikon.
S: What specifically would you like to see included?
N: We need language skills, writing skills, research skills (compulsory) at 3rd year level.
S: Your views on L2?
N: We are far better with our Bantu education. In as much as L2 is a problem but it is accepted in SA as a standard language. I do not like that my own children cannot speak a word of Xhosa.
S: Do you think home is important for learning development?
N: Yes. Children should benefit from family support but parents do not have the time to help their children.

INTERVIEW TRANSCRIPTION SHEET 3

Interview: Focus group

Interviewees: VM: TELP coordinator
LM: Counseling education and vocational and works with student development office
FS: Student development officer in Student Affairs: Student academic development, leadership development, evaluation of programmes and TELP, Technikon…

STUDENTS' BACKGROUNDS

SN: Is academic underpreparedness linked to culture or background where students come from, i.e., historically disadvantaged?

VM: We are in an unfortunate situation in that students from our communities are not well prepared and they don't get good school passes and we have to absorb them because they are closer. But if they get good passes they go elsewhere.
SN: Where do they come from?
FS: From surrounding rural areas because we are in a rural area. Those from urban areas are far outnumbered by the rural ones.

HOME LEARNING SUPPORT

SN: Does home play any role in developing your students?
VM: If it is academic development there is not much role for home. Development is not like a sandwich, it is integrated. Exposure to experience is a form of development. Academic development varies, e.g., career guidance. If I come from a family of educated brothers they can play a role in student's academic development but if I come from a non-educated family then I am disadvantaged.
LM: Importance of social development at home plays an important socialization role.
FS: Our students come from rural backgrounds and Eastern Cape is one of the poorest provinces. To a large extent people rely on pensions and subsistence grants and whatever we have was provided by the homelands. Industries in Butterworth have left. So most students cannot afford to pay their fees.

LANGUAGE

SN: Can language be used as a tool of empowerment from underpreparedness to preparedness?

VM: Language is crucial because it transfers knowledge. If students fail to muster English then they are disadvantaged and most of the time the student knows what he wants to ask but cannot express it in the form of language. If students fails to master English they have limitations in hearing the lecturer. Language development should be central if we talk about underpreparedness because it unlocks the barriers. Not only understanding the lecturers but expressing themselves as well.

CODE SWITCH/MIXING

SN: Do your students think between Xhosa and English?
FS: Yes.
VM: Yes you can see the Xhosa written in English. It is a serious problem.
FS: I feel strongly about language because language has to be the basis for intervention.

XHOSA AND DISCOURSE

SN: Is Xhosa influence affecting discourse strongly in your view?
SN: [Clarifying above question] Do you see your oral background as an obstacle to your becoming professional?
VM: African communication differs from western. There is always a difference between the written and verbal communication. Written communication is limited in that you cannot sense mood, for instance. Sometimes the quiet students do well in written communication than the outspoken ones.

SUPPORT SERVICES

SN: What do support services do for peer help?
LM: There are peer helpers and they are trying to help students.
FS: Academic support is not a priority at the institution. The human resources element has to change in that we are understaffed. Academic faculties want us to play a significant role holistically. When you approach lecturers they cry about time slots about life skills. They don't value life skills for what it is but because SERTEC prescribes for its inclusion.

WORKSTUDY

SN: What would be the structure of your work study programme?
VM: USAID has committed itself to support work study.
SN: Will workstudy mainstream your services?

FS: One of our aims is to penetrate the academic faculties. It is one of our trump cards. We are also trying to establish a Unit for academic support.
LM: It is a form of experiential training.
SN: Are your services project orientated?
VM: The word project is a USAID terminology. They use indicators, planning, outcomes, evaluation and I like the terminology because it keeps you on your toes.
SN: Do you see workstudy as a new model for academic development?
FS: Yes, we want this to become an institutionalized project.

EFFORT AND STRATEGY

SN: Do your students lack effort and strategy academically?
FS: With the students we have there is general lack of motivation which I do not know if its related to the disintegrating school system.

INTERVIEW TRANSMISSION SHEET 4

Interviewee: CL, HoD IT and Senior Lecturer, ... Technikon

Duration 20 Min

UNDERPREPARED STUDENTS

SN: Do you encounter AU students?
C: Yes. Students do not have access to computers as an institutional tool. They struggle with technology at first year level.
SN: How do you help the students in this situation?
C: By supplementing instruction – use computers in absence of lectures and introduce workshops to help students in this field.
SN: Do students have difficulty with course concepts?
C: No. Not enough qualified staff in IT.

BRIDGING

SN: Have you looked at developing an adjunct programme?
C: No. We have some funding from the community.
SN: Which schools feed the technikon?
C: Eastern Cape schools. We need to introduce a bridging course or an extension of a normal 3 year course.

INTERVIEW TRANSCRIPTION SHEET 3

Interview: Focus group

Interviewees: VM: TELP coordinator
LM: Counseling education and vocational and works with student development office
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STUDENTS' BACKGROUNDS

SN: Is academic underpreparedness linked to culture or background where students come from, i.e., historically disadvantaged?

VM: We are in an unfortunate situation in that students from our communities are not well prepared and they don't get good school passes and we have to absorb them because they are closer. But if they get good passes they go elsewhere.
SN: Where do they come from?
FS: From surrounding rural areas because we are in a rural area. Those from urban areas are far outnumbered by the rural ones.

HOME LEARNING SUPPORT

SN: Does home play any role in developing your students?
VM: If it is academic development there is not much role for home. Development is not like a sandwich, it is integrated. Exposure to experience is a form of development. Academic development varies, e.g., career guidance. If I come from a family of educated brothers they can play a role in student's academic development but if I come from a non-educated family then I am disadvantaged.
LM: Importance of social development at home plays an important socialization role.
FS: Our students come from rural backgrounds and Eastern Cape is one of the poorest provinces. To a large extent people rely on pensions and subsistence grants and whatever we have was provided by the homelands. Industries in Butterworth have left. So most students cannot afford to pay their fees.

LANGUAGE

SN: Can language be used as a tool of empowerment from underpreparedness to preparedness?

VM: Language is crucial because it transfers knowledge. If students fail to muster English then they are disadvantaged and most of the time the student knows what he wants to ask but cannot express it in the form of language. If students fails to master English they have limitations in hearing the lecturer. Language development should be central if we talk about underpreparedness because it unlocks the barriers. Not only understanding the lecturers but expressing themselves as well.

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FS: Yes.
VM: Yes you can see the Xhosa written in English. It is a serious problem.
FS: I feel strongly about language because language has to be the basis for intervention.

XHOSA AND DISCOURSE

SN: Is Xhosa influence affecting discourse strongly in your view?
SN: [Clarifying above question] Do you see your oral background as an obstacle to your becoming professional?
VM: African communication differs from western. There is always a difference between the written and verbal communication. Written communication is limited in that you cannot sense mood, for instance. Sometimes the quiet students do well in written communication than the outspoken ones.

SUPPORT SERVICES

SN: What do support services do for peer help?
LM: There are peer helpers and they are trying to help students.
FS: Academic support is not a priority at the institution. The human resources element has to change in that we are understaffed. Academic faculties want us to play a significant role holistically. When you approach lecturers they cry about time slots about life skills. They don't value life skills for what it is but because SERTEC prescribes for its inclusion.

WORKSTUDY

SN: What would be the structure of your work study programme?
VM: USAID has committed itself to support work study.
SN: Will workstudy mainstream your services?

FS: One of our aims is to penetrate the academic faculties. It is one of our trump cards. We are also trying to establish a Unit for academic support.
LM: It is a form of experiential training.
SN: Are your services project orientated?
VM: The word project is a USAID terminology. They use indicators, planning, outcomes, evaluation and I like the terminology because it keeps you on your toes.
SN: Do you see workstudy as a new model for academic development?
FS: Yes, we want this to become an institutionalized project.

EFFORT AND STRATEGY

SN: Do your students lack effort and strategy academically?
FS: With the students we have there is general lack of motivation which I do not know if its related to the disintegrating school system.

INTERVIEW TRANSMISSION SHEET 4

Interviewee: CL, HoD IT and Senior Lecturer, ... Technikon

Duration 20 Min

UNDERPREPARED STUDENTS

SN: Do you encounter AU students?
C: Yes. Students do not have access to computers as an institutional tool. They struggle with technology at first year level.
SN: How do you help the students in this situation?
C: By supplementing instruction – use computers in absence of lectures and introduce workshops to help students in this field.
SN: Do students have difficulty with course concepts?
C: No. Not enough qualified staff in IT.

BRIDGING

SN: Have you looked at developing an adjunct programme?
C: No. We have some funding from the community.
SN: Which schools feed the technikon?
C: Eastern Cape schools. We need to introduce a bridging course or an extension of a normal 3 year course.

SN: Any plans for development?
C: They think of a remedial school.
SN: What would tell that a student is underprepared?
C: If congenital assessment shows continual failure, they fail to understand course concepts.
SN: When you see that a student is not performing well what do you do?
C: Inform HoD and bring in academic support.

STUDENT HELPERS

SN: Who does training for student helpers?
C: I am new in this position. Lecturers are told to set up after-lecture consultations but they [students] don't come.
SN: If the students do not come for consultations what does that mean for the lecturer?
C: I don't know whether they are scared or what.
SN: Have you seen students leaving your technikon without completing?
C: No. We have no high failure rate but we have lengthy repeaters.
SN: Should the curriculum be changed?
C: We meet once a year to revise the curriculum in my department.

EXPERIENTIAL TRAINING

SN: Experiential training
C: It is not compulsory for my department but if you go to industry you need that.

READING AND NET SURFING

SN: Do your students prefer net surfing over reading?
C: There is a problem of books coming out late but the internet is up to date. Students do read.
SN: 5 months as HoD: any personal dreams?
C: Look for industry ready students who can finish and get a job easily. Funding is our main problem. Our students should get more practical IT experience.

INTERVIEW TRANSCRIPTION SHEET 5

Interviewee: BA, HoD Communication and Languages (12 years)

....Technikon

ACADEMIC UNDERPREPAREDNESS

SN: Is AU a problem of your institution?
BA: Yes, particularly language, i.e., English. Many of our students come from disadvantaged backgrounds and some of our teachers are themselves not very proficient in the language [English]. There are teachers teaching English in vernacular, i.e., Xhosa, so students do not practice English and they are not prepared language wise. This is what keeps them back in their courses.

LANGUAGE POLICY

SN: What is the language policy of your institution?
BA: English – communication in English which is a credit subject.

CODE SWITCHING

SN: Do you experience code switching between English and Xhosa?
BA: We have noticed that students who under perform in English under perform in other courses as well.
SN: What language support is provided?
BA: Computers and other programmes to address reading skills and comprehension exercises. They sometimes code mix and they would rather use their mother tongue.

COURSE CONCEPTS

SN: Any concept specific problems?
BA: Memorisation is the major problem.

PROBLEM SOLVING

SN: How is problem solving possible without concept definition skills?
BA: Students can define concepts in mother tongue and return to English.

BASIC CONCEPTS

SN: Do students experience problems with basic concepts like abstract and minutes?
BA: Yes, this is a serious problem. We do a lot of practise to define those concepts. We really scale them down.
SN: Do you have time for that?
BA: No, we are limited.

ATTITUDE TO LEARNING AND LECTURERS

SN: Do students own learning or do they come to see you with problems?
BA: My doors are open but the fear of the teacher is still there and it boils down to the language problem. One or two do come. The problem is that they think the teacher is always right.

STUDENT BACKGROUNDS

SN: Are your students from rural backgrounds?
BA: Yes.
SN: Do you describe them as being from disadvantaged backgrounds?
BA: Yes.
SN: Do they define themselves in this way?
BA: They accept it and that is what hurts me because there are some of the things they have I never had as a student.
SN: Why do you say that?
BA: They come in and they are shy and they tend to accept they are not as good as those from white schools.
SN: You link psychological attitude of accepting disadvantage to withdrawal?
BA: Yes, even with Xhosa they don't contribute in class and it is worse with English.

BODY LANGUAGE

SN: What body language do they use to communicate what is going on inside?
BA: They sometimes smile and I ask them what are you smiling about and nothing, no response.
SN: Is this problem linked to fear of self exposure?
BA: Yes, that is the crux of the matter! Fear to make mistakes.

SELF CONFIDENCE

SN: Does low self confidence affect academic preparedness?
BA: Yes, it is a problem but some do succeed at second year but many struggle.

SUPPORT PROGRAMMES

SN: Do you have any support programmes?
BA: Yes, we want to address the writing skills etc.

TELEPHONIC INTERVIEW TRANSCRIPTION SHEET 6

Interviewee: SV, EAP (for first year students) lecturer, ...

Technikon

ADMISSION PROGRAMMES

SN: What are your requirements?
SV: I don't know but I have engaged with colleagues to research, test for academic underpreparedness and establish language levels and requirements for students who are L2 English speakers and users. Our of our recommendations is for the technikon to look at academic underpreparedness.

ACADEMIC UNDERPREPAREDNESS

SN: Is cultural deprivation a major aspect of AU?
SV: I think the major factor is lack of education or being insufficiently prepared for HE.

STUDENT BACKGROUNDS

SN: Where do your students come from?
SV: They come from in or near Durban and KZN. They are L2 English students with Zulu as first language.
SN: Have most of your students gone through poor schooling?
SV: Yes, but not all.
SN: How do you describe poor schooling?
SV: One of the biggest disadvantages is the background from school and home which is not highly literate and this makes it difficult with English levels and so they are unfamiliar

with text type or acceptable writing practice and that stems from lack of literacy, lack of school resources and inadequately trained teachers.

L1 AND L2 INTERACTION

SN: Do they have to shuttle between the L1 and L2?
SV: They do a bit of code switching but its not a really bad thing.

COGNITIVE PROBLEMS

SN: What are major cognitive problems?
SV: Difficult to quantify.
SN: Is linear thinking skills one of the problem areas?
SV: I think there is a problem with that especially the inability to apply what you have learnt. The educational background is responsible for rote learning, memorization of facts, not questioning and waiting for someone to tell you what to do and what not to do which is clearly not the kind of approach expected at tertiary level.

SCHOOL AND TERTIARY LEVEL MEDIUM

SN: School and tertiary level medium?
SV: There is a need for mother tongue assistance for the students, i.e., tutoring and going over the course content.

ATTITUDE TO LEARNING

SN: Is learning not the learner's responsibility?
SV: Yes, but if we do not have the tools for accessing information in that media of learning then effective learning cannot take place.
SN: Is effective learning inhibited by factors outside of learning?
SV: Yes, outside of learner's control but once they are currently admitted to institutions they do not have an adequate level of English.

DEPARTMENTAL AFFILIATION AND EAP

SN: Your department?
SV: We come under the department of language and communication and EAP which is a communication course module.
SN: How are you offering EAP?
SV: It is part of the student mainstream and they have four weekly periods. They were tested at the beginning of the year using the Placement Test in English for Educational Purposes and we decided that students who got below 45% would attend EAP.
SN: Do you consider this a working model?

SV: Yes, we offered it as a pilot last year and we are continually refining and modifying materials and improving it as we go. The structure is workable and maybe it will be argued in the long run that it should be credit bearing.

STUDENT FEEDBACK

SN: What is students' feedback?
SV: On the whole it is positive in my case and the students find it helpful although some students have some reservations about the course.
SN: What are the reservations?
SV: We have a number of students who are Indian and English is their first language, but a number of my students are more mature students from the workplace and they feel the course benefits them but they see it as meant for underprepared students. One or two students got a good mark for matric and do not understand why they must attend the course [pause].
SV: [Cont] I have a good mark in English and I don't have to do this course. Our response was that this is not a course in English but an academic literacy course. There are some SI classes conducted in maths, there is a maths tutorship.

DOING THINGS DIFFERENTLY [BENCHMARKING]

SN: If you were to do things differently what would you do differently in terms of your work?
SV: I would say that from work we have done it seems clear that students below a certain level are not likely to succeed in their studies. I believe it is incorrect to accept students not likely to succeed but if you do accept such students you must be there to help them succeed. If you get students below 45% and are not likely to succeed, we need to give them something more than an EAP course and are not doing the full course. All institutions should be doing this.

RESOURCES

SN: Are you operating within scare resources?
SV: We are dealing with students who are below the ability to [inaudible] they are struggling with EAP and other course assignments. We need an orientation year.

APPENDIX F

FREQUENCY DISTRIBUTION TABLES

ALL TECHNIKONS

The comprehensive analysis of the data (as mentioned in Chapter 4) was undertaken using *Statistica 6.0* and the rough books. These rough books and the data score sheets are available electronically from Ms Lorraine van As (lva@sun.ac.za) a secretary at the Department of Didactics. As the following examples show, hard copy is not a useful means of accessing and exploring the data. It would also mean that the dissertation would be over 500 pages – hardly conducive to use by researchers.

FAMILY BACKGROUND: QUESTION 5: WHAT KIND OF WORK DOES THE BREADWINNER IN YOUR FAMILY DO?

Summary Table: Expected Frequencies (studentsXXa.sta)
Marked cells have counts > 10
Pearson Chi-square: 70.6467, df=16, p=.000000

Technikon	5 Work 1	5 Work 2	5 Work 3	5 Work 4	5 Work 5
1	7.67167	23.1330	9.32403	5.66524	9.20601
2	30.68670	92.5322	37.29614	22.66094	36.82403
3	7.11373	21.4506	8.64592	5.25322	8.53648
4	10.04292	30.2833	12.20601	7.41631	12.05150
5	9.48498	28.6009	11.52790	7.00429	11.38197
All Grps	65.00000	196.0000	79.00000	48.00000	78.00000

QUESTION 6: ARE YOU THE FIRST PERSON IN YOUR FAMILY TO STUDY AT A TECHNIKON (OR UNIVERSITY)?

	Summary Frequency Table (studentsXXa.sta Marked cells have counts > 10 (Marginal summaries are not marked)		
	Technikon	6 First generation 1	6 First gen 2
Count	1	30	
Column Percent		11.54%	
Count	2	108	
Column Percent		41.54%	
Count	3	37	
Column Percent		14.23%	
Count	4	42	
Column Percent		16.15%	
Count	5	43	
Column Percent		16.54%	
Count	All Grps	260	

Summary Table: Expected Frequencies (studentsXXa.sta)
Marked cells have counts > 10
Pearson Chi-square: 8.13593, df=4, p=.086732

Technikon	6 First generation 1	6 First generation 2	Row Totals
1	30.6867	24.3133	55.0000
2	120.5150	95.4850	216.0000
3	30.1288	23.8712	54.0000
4	40.7296	32.2704	73.0000
5	37.9399	30.0601	68.0000
All Grps	260.0000	206.0000	466.0000

QUESTION 7: WHICH ONE OF THE FOLLOWING PERSONS HELPED YOU THE MOST WITH YOUR HIGH SCHOOL STUDIES?
1. Mother 2. Father 3. Brother 4. Sister 5. Friend 6. Other

	Summary Frequency Table (studentsXXa.sta Marked cells have counts > 10 (Marginal summaries are not marked)			
	Technikon	7 Helper 1	7 Helper 2	7 Helper 3
Count	1	28	6	2
Column Percent		14.36%	8.00%	5.88%
Count	2	82	25	21
Column Percent		42.05%	33.33%	61.76%
Count	3	27	10	2
Column Percent		13.85%	13.33%	5.88%
Count	4	27	18	5
Column Percent		13.85%	24.00%	14.71%
Count	5	31	16	4
Column Percent		15.90%	21.33%	11.76%
Count	All Grps	195	75	34

Summary Table: Expected Frequencies (studentsXXa.sta)
Marked cells have counts > 10
Pearson Chi-square: 35.1971, df=20, p=.019095

Technikon	7 Helper 1	7 Helper 2	7 Helper 3	7 Helper 4	7 Helper 5
1	23.7605	9.13866	4.14286	4.26471	9.62605
2	90.9454	34.97899	15.85714	16.32353	36.84454
3	22.1218	8.50840	3.85714	3.97059	8.96218
4	29.9055	11.50210	5.21429	5.36765	12.11555
5	28.2668	10.87185	4.92857	5.07353	11.45168
All Grps	195.0000	75.00000	34.00000	35.00000	79.00000

HIGH SCHOOL LEARNING EXPERIENCE:
QUESTION 9: HOW OFTEN DID YOUR TEACHERS AT HIGH SCHOOL USE ENGLISH?

Summary Frequency Table (studentsXXa.sta)
Marked cells have counts > 10
(Marginal summaries are not marked)

	Technikon	9 English 1	9 English 2	9 English 3
Count	1	23	12	14
Column Percent		29.49%	8.45%	5.98%
Count	2	28	54	135
Column Percent		35.90%	38.03%	57.69%
Count	3	24	18	5
Column Percent		30.77%	12.68%	2.14%
Count	4	2	22	49
Column Percent		2.56%	15.49%	20.94%
Count	5	1	36	31
Column Percent		1.28%	25.35%	13.25%
Count	All Grps	78	142	234

Summary Table: Expected Frequencies (studentsXXa.sta)
Marked cells have counts > 10
Pearson Chi-square: 140.733, df=12, p=0.00000

Technikon	9 English 1	9 English 2	9 English 3	9 English 4
1	9.32075	16.9686	27.9623	2.74843
2	36.62893	66.6834	109.8868	10.80084
3	8.83019	16.0755	26.4906	2.60377
4	11.93711	21.7317	35.8113	3.51992
5	11.28302	20.5409	33.8491	3.32704
All Grps	78.00000	142.0000	234.0000	23.00000

	Summary Frequency Table (studentsXXa.sta Marked cells have counts > 10 (Marginal summaries are not marked)		
	Technikon	9.1. Understanding 1	9.1. Unde 2
Count	1	0	
Column Percent		0.00%	
Count	2	49	
Column Percent		73.13%	
Count	3	0	
Column Percent		0.00%	
Count	4	5	
Column Percent		7.46%	
Count	5	13	
Column Percent		19.40%	
Count	All Grps	67	

Summary Table: Expected Frequencies (studentsXXa.sta)
Marked cells have counts > 10
Pearson Chi-square: 94.2672, df=8, p=.000000

Technikon	9.1. Understanding 1	9.1. Understanding 2	9
1	8.72558	32.2977	
2	30.38372	112.4651	
3	8.25814	30.5674	
4	9.97209	36.9116	
5	9.66047	35.7581	
All Grps	67.00000	248.0000	

QUESTION 12:
ON A SCALE OF 1 TO 5, HOW DO YOU RATE YOUR HIGH SCHOOL LEARNING EXPERIENCE IN TERMS OF EACH OF THE FOLLOWING SETS OF ATTRIBUTES? (FOR EACH OF A, B AND C, PLEASE MARK THE NUMBER THAT BEST REPRESENTS YOUR HIGH SCHOOL LEARNING EXPERIENCE)

	Summary Frequency Table (studentsXXa.sta Marked cells have counts > 10 (Marginal summaries are not marked)			
	Technikon	12 Boring 1	12 Boring 2	12 Borin 3
Count	1	4	1	
Column Percent		30.77%	3.57%	8.74
Count	2	4	20	6
Column Percent		30.77%	71.43%	63.11
Count	3	1	0	
Column Percent		7.69%	0.00%	10.68
Count	4	2	4	
Column Percent		15.38%	14.29%	9.71
Count	5	2	3	
Column Percent		15.38%	10.71%	7.77
Count	All Grps	13	28	1(

Summary Table: Expected Frequencies (studentsXXa.sta)
Marked cells have counts > 10
Pearson Chi-square: 41.8020, df=16, p=.000423

Technikon	12 Boring 1	12 Boring 2	12 Boring 3	12 Boring 4
1	1.45414	3.13199	11.5213	14.2058
2	6.25280	13.46756	49.5414	61.0850
3	1.54139	3.31991	12.2125	15.0582
4	1.97763	4.25951	15.6689	19.3199
5	1.77405	3.82103	14.0559	17.3311
All Grps	13.00000	28.00000	103.0000	127.0000

Summary Frequency Table (studentsXXa.sta)
Marked cells have counts > 10
(Marginal summaries are not marked)

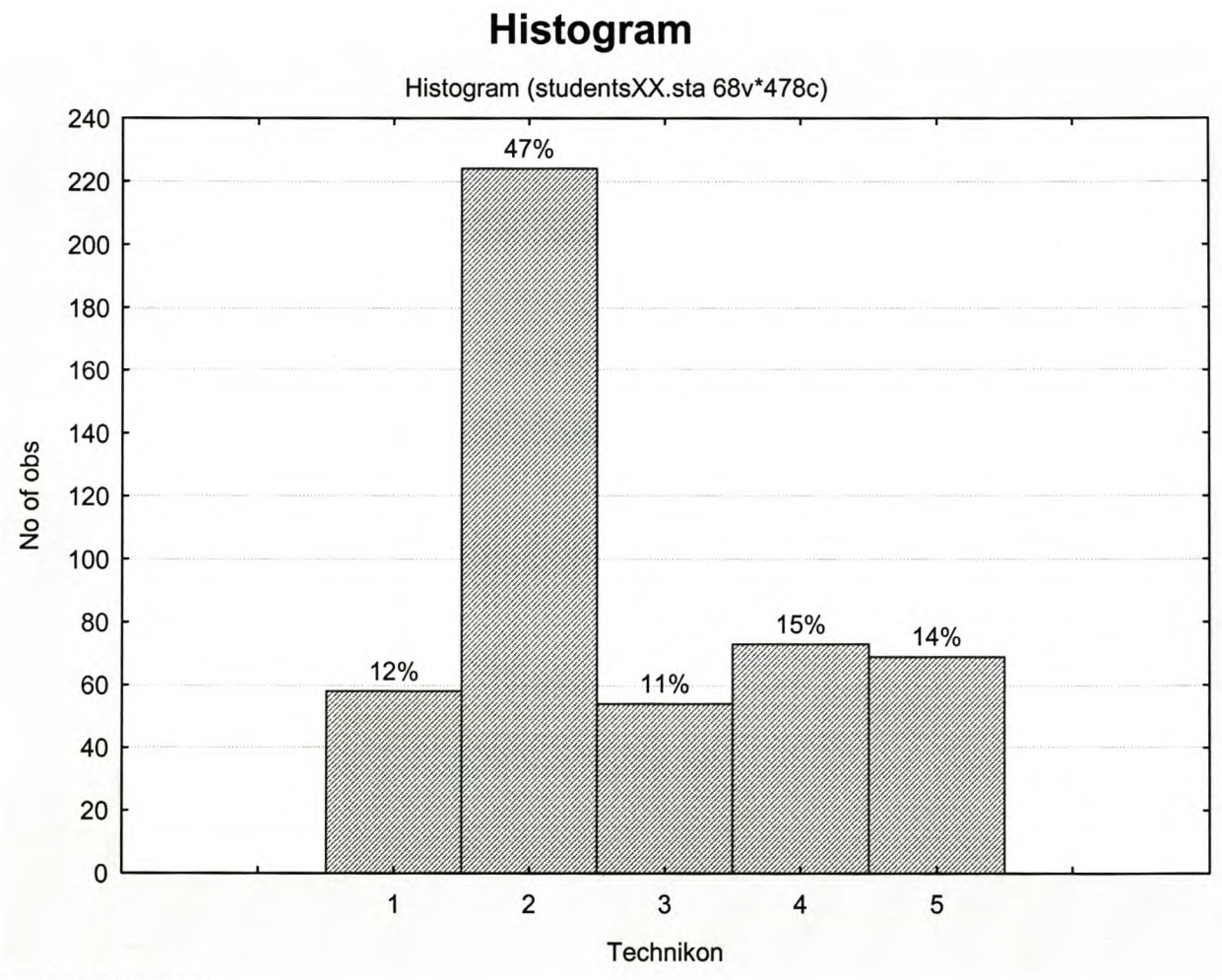
	Technikon	12 Demanding 1	12 Demanding 2
Count	1	9	9
Column Percent		23.68%	20.45%
Count	2	10	14
Column Percent		26.32%	31.82%
Count	3	6	7
Column Percent		15.79%	15.91%
Count	4	7	9
Column Percent		18.42%	20.45%
Count	5	6	5
Column Percent		15.79%	11.36%
Count	All Grps	38	44

Summary Table: Expected Frequencies (studentsXXa.sta)
Marked cells have counts > 10
Pearson Chi-square: 52.5326, df=20, p=.000095

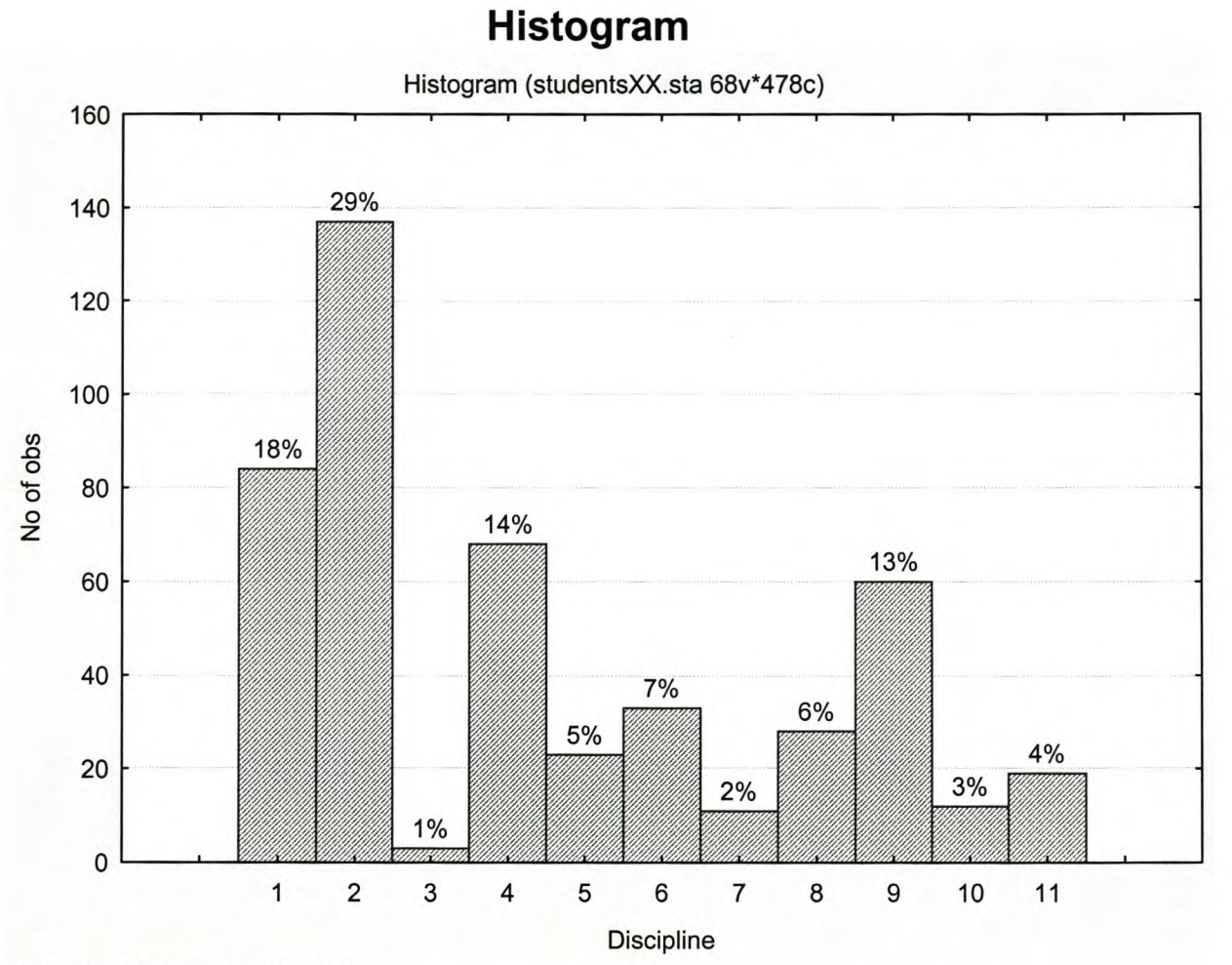
Technikon	12 Demanding 1	12 Demanding 2	12 Demanding 3
1	4.61088	5.33891	21.2343
2	17.80753	20.61925	82.0084
3	4.29289	4.97071	19.7699
4	5.80335	6.71967	26.7259
5	5.48536	6.35146	25.2615
All Grps	38.00000	44.00000	175.0000

APPENDIX G

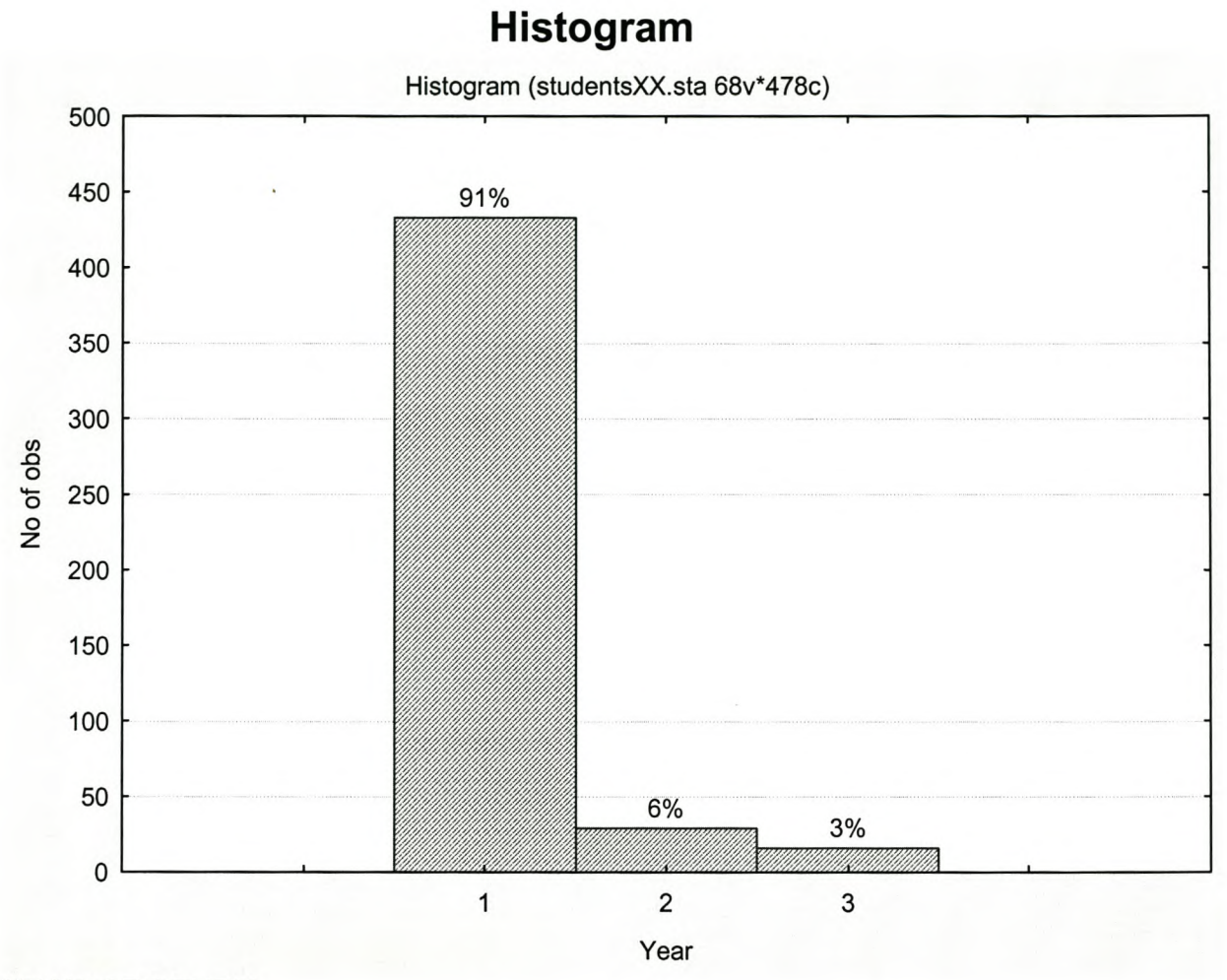
HISTOGRAMS



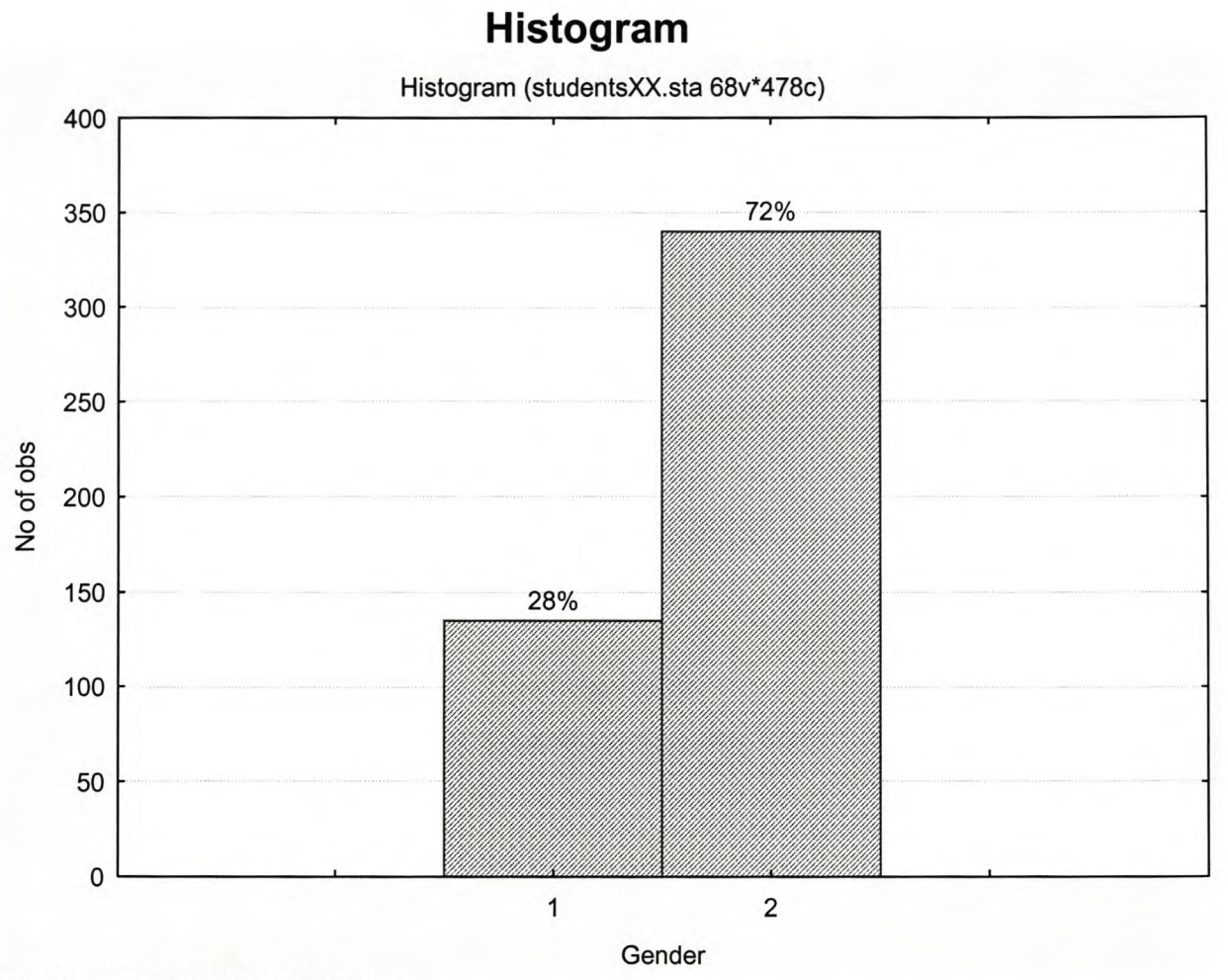
TECHNIKONS



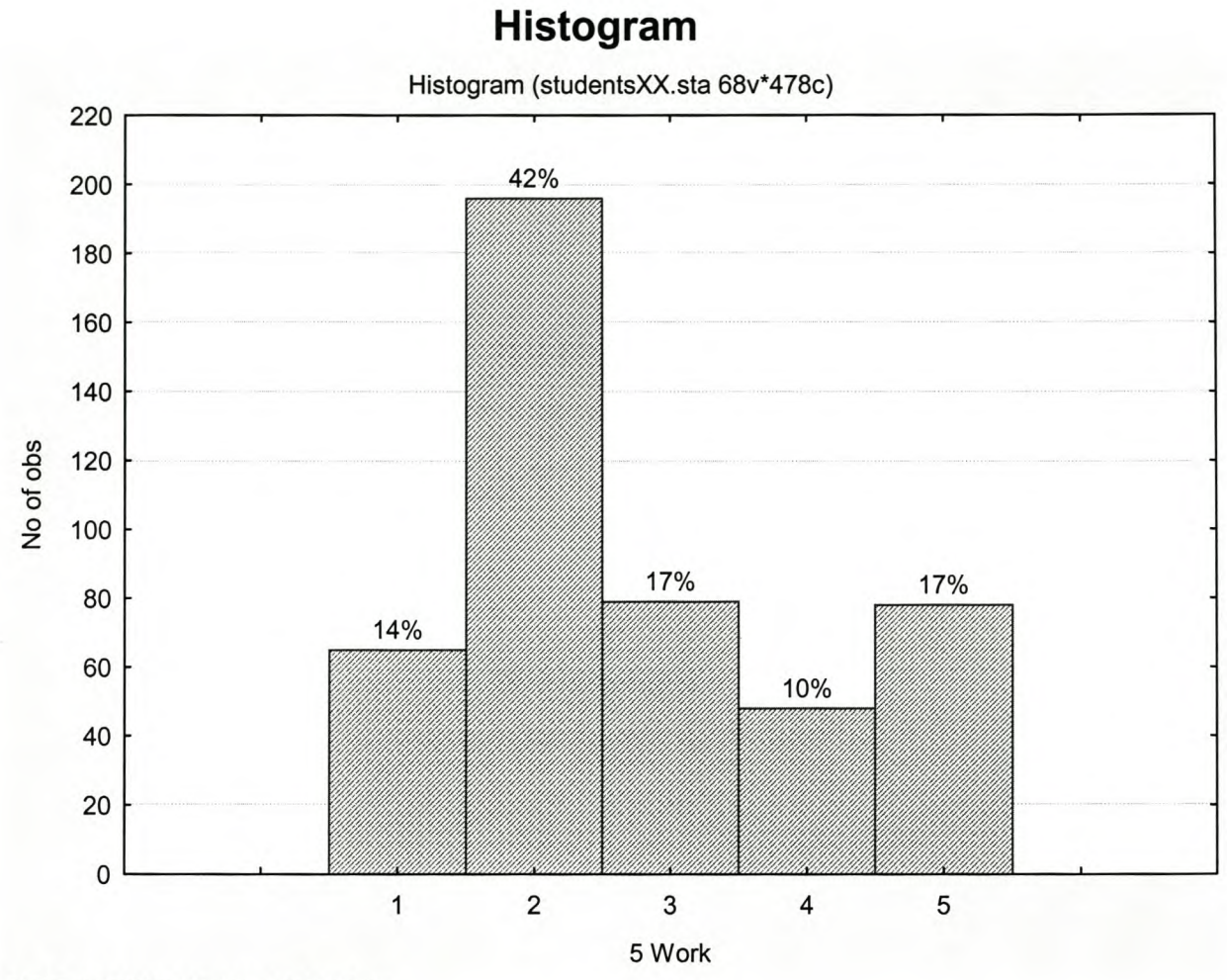
TECHNIKON DISCIPLINES



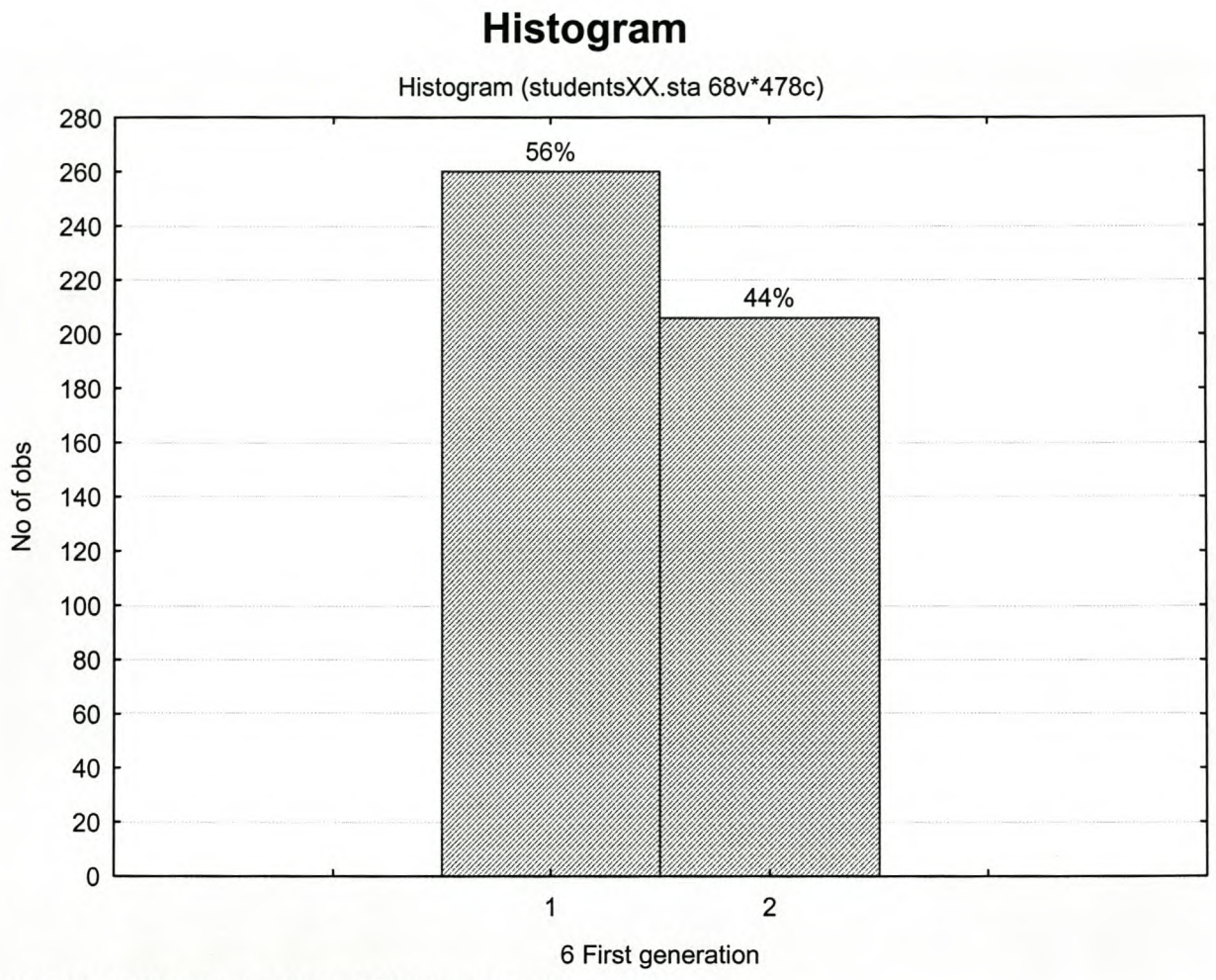
YEAR OF STUDY



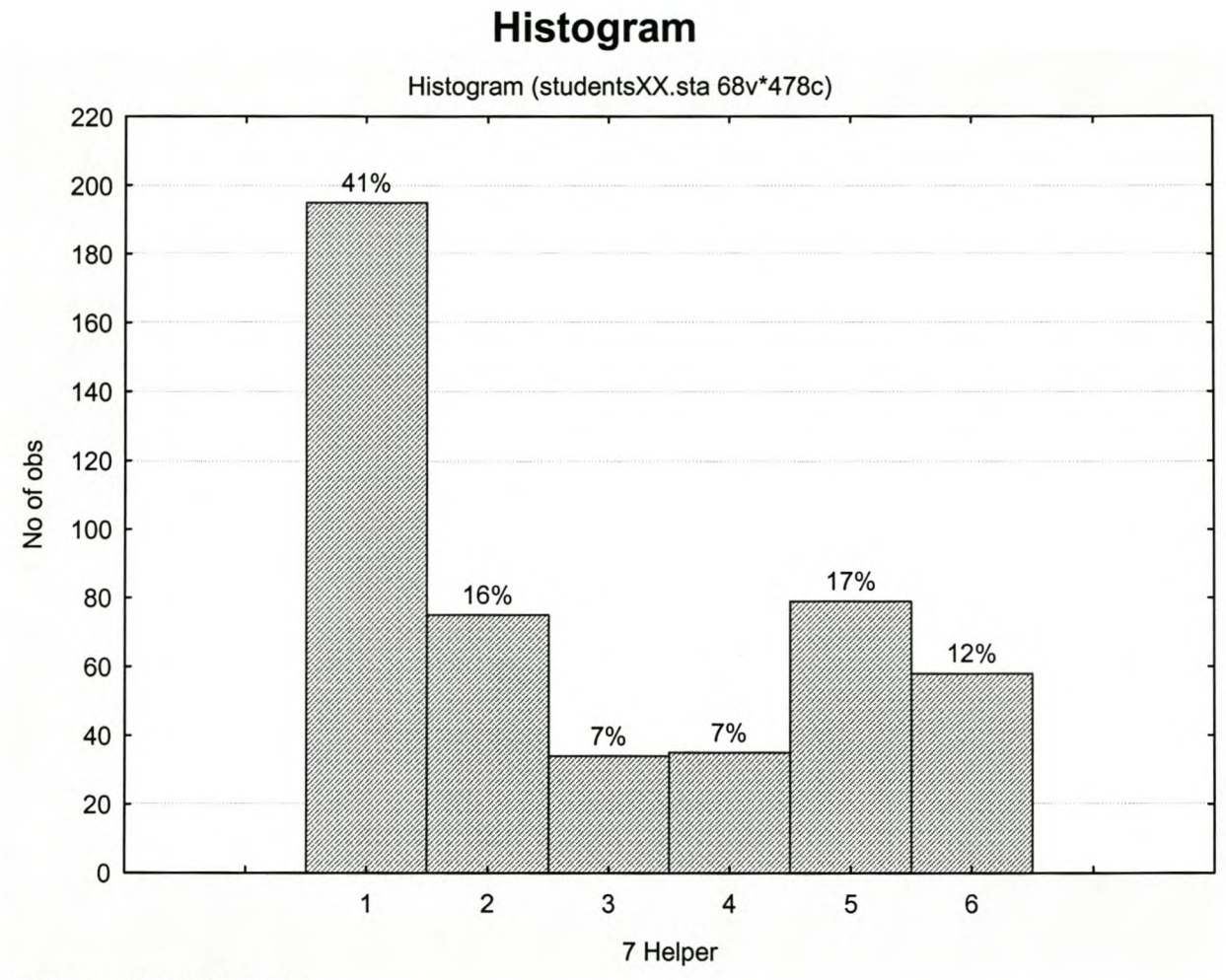
GENDER OF RESPONDENTS



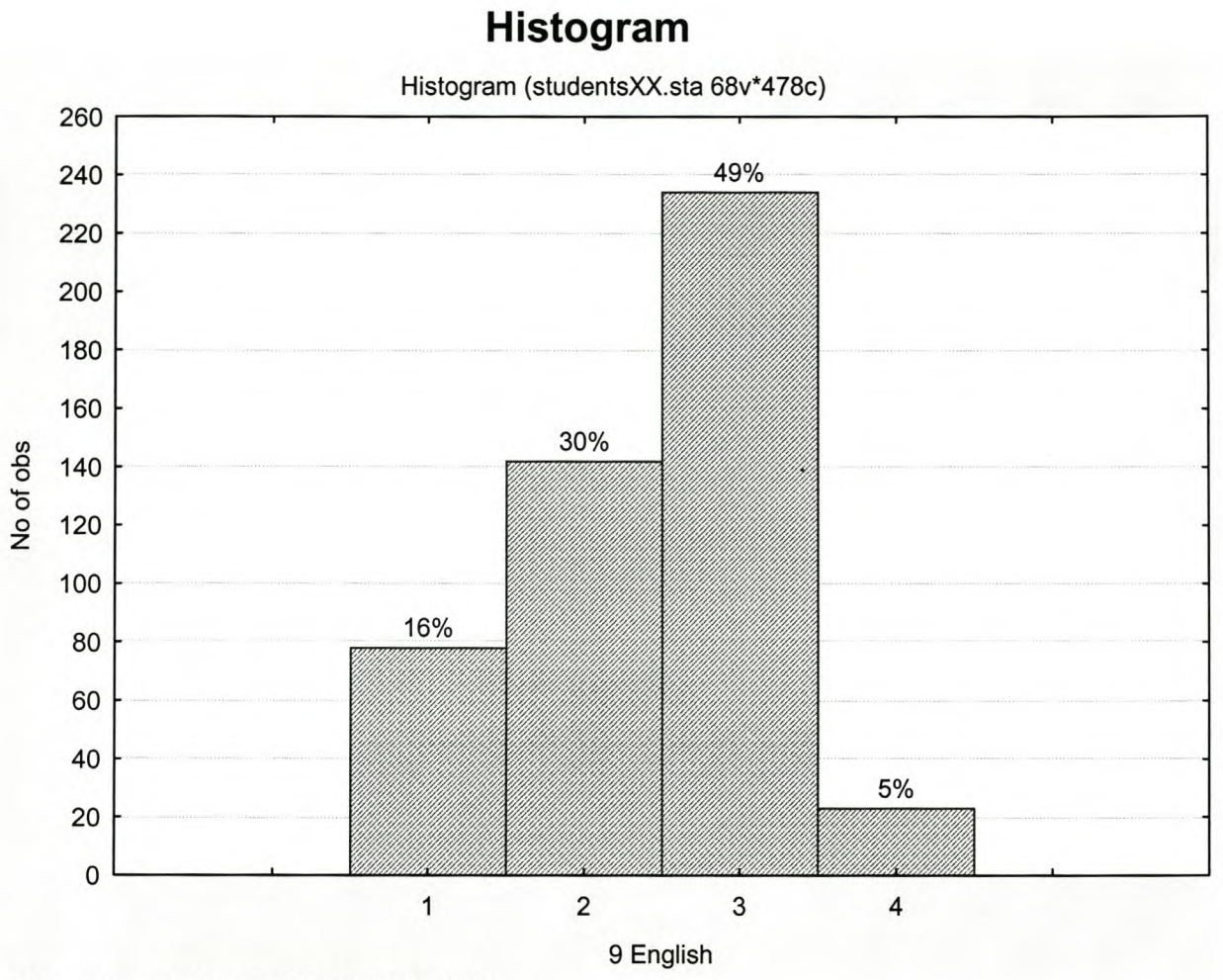
BREADWINNER'S WORK



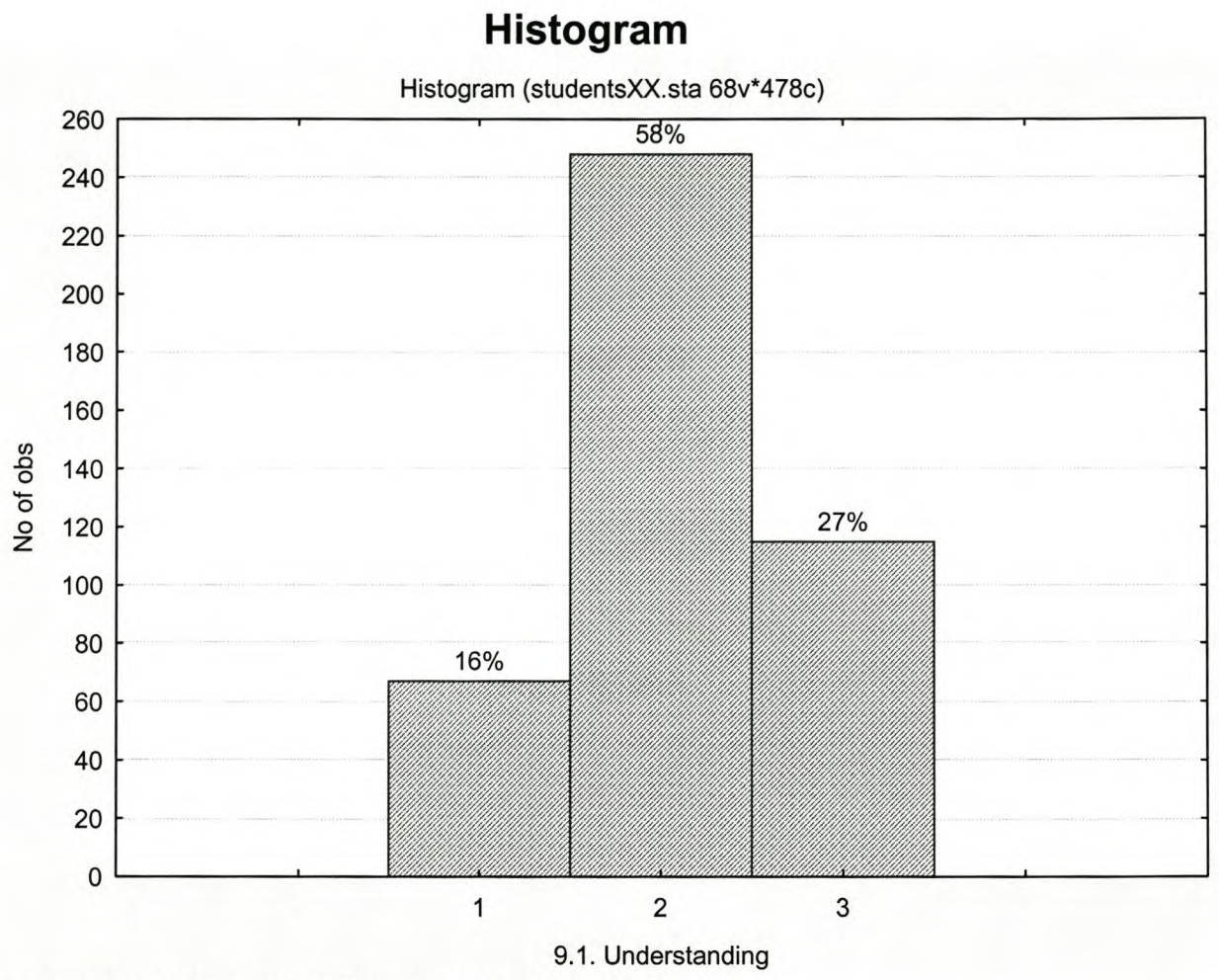
FIRST GENERATION TECHNIKON STUDENTS



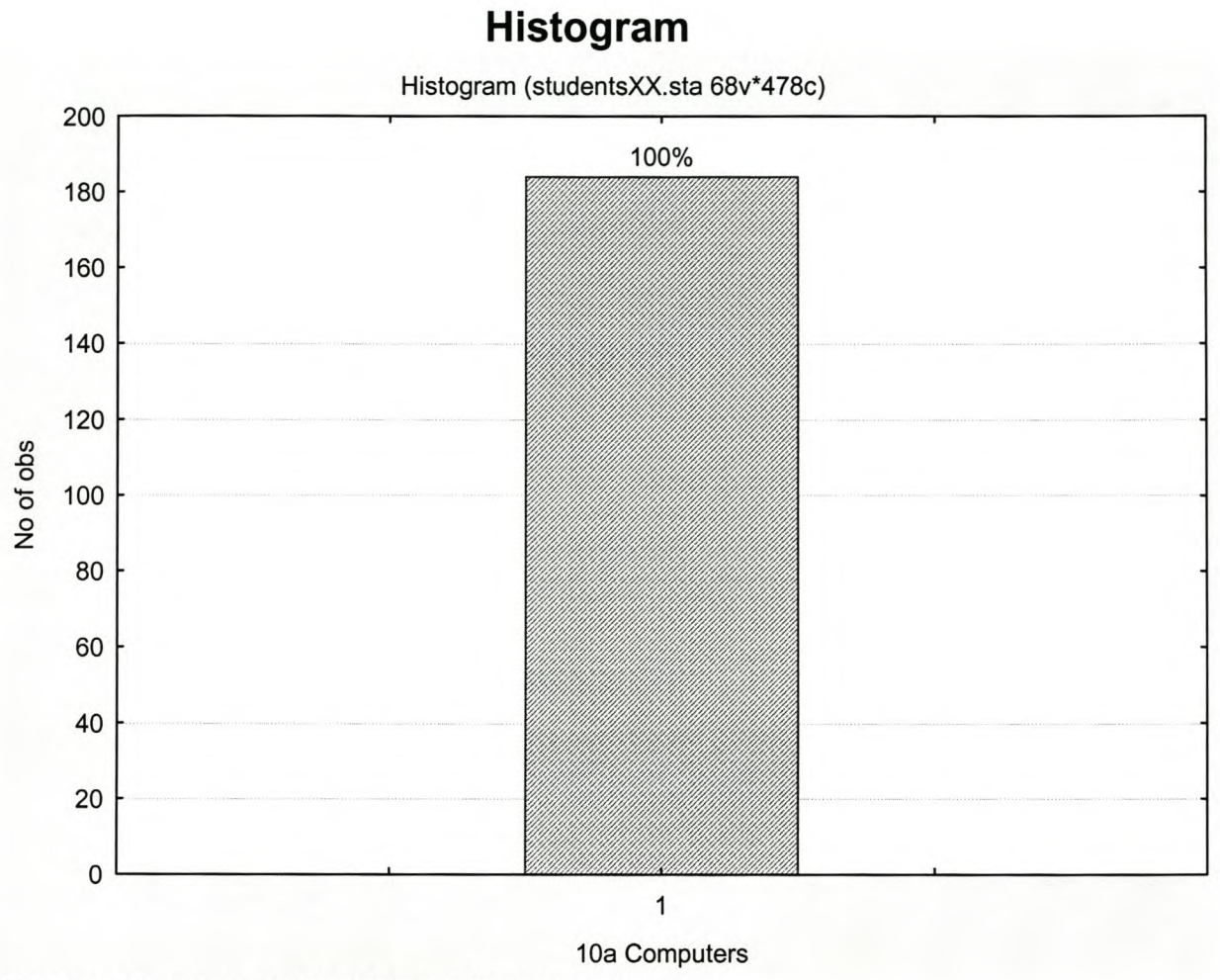
ACADEMIC HELPER



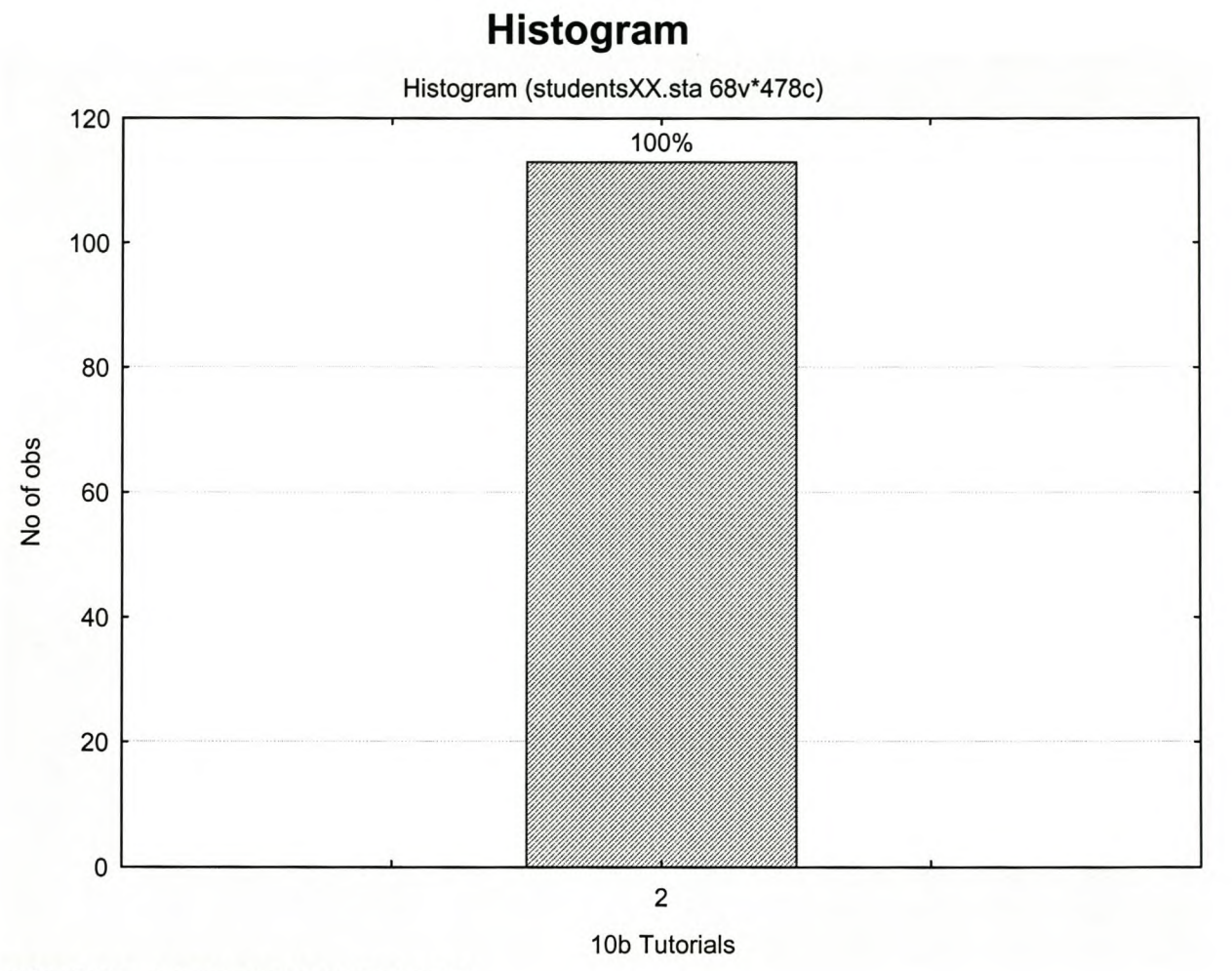
ENGLISH AS A SCHOOL MEDIUM



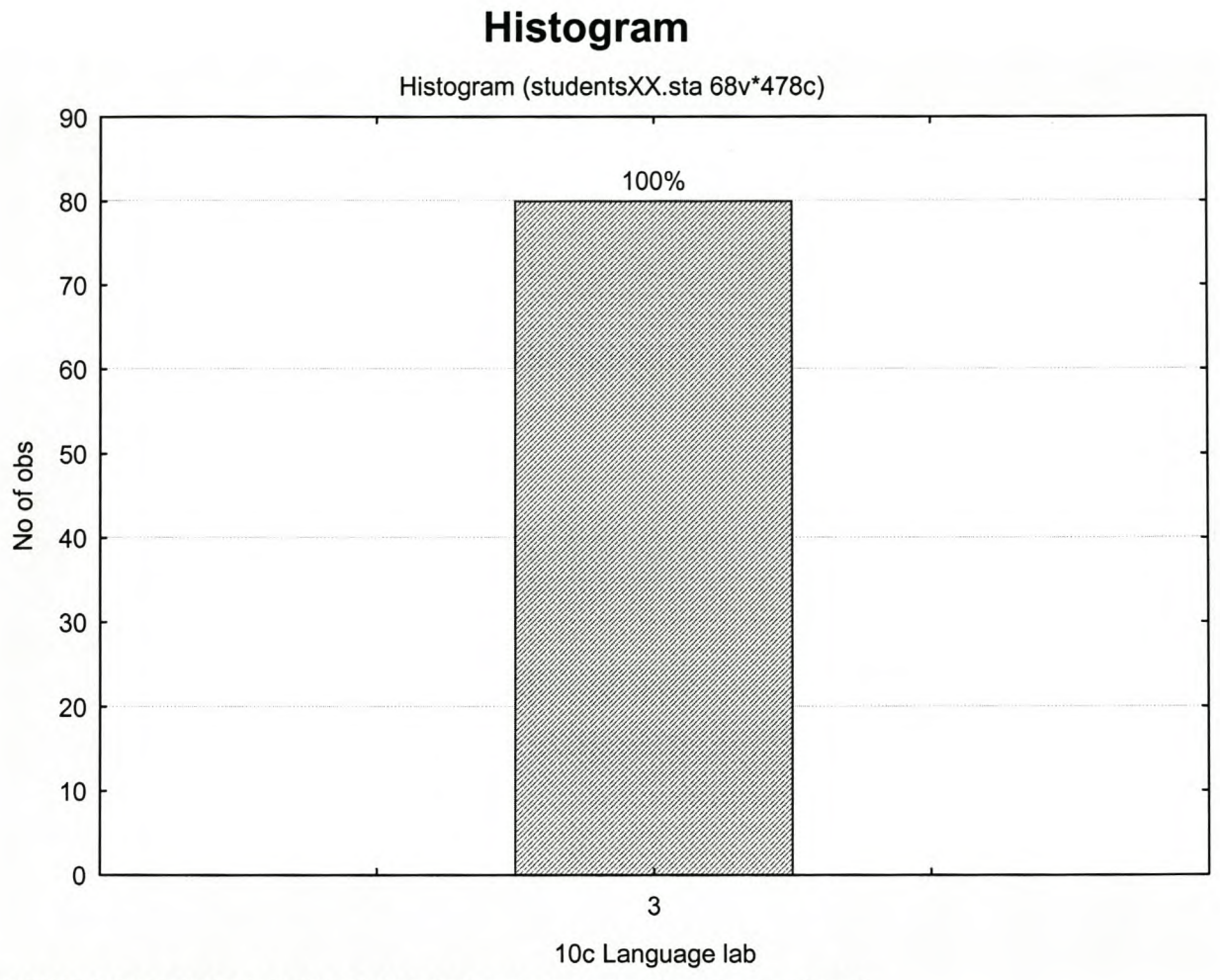
UNDERSTANDING SCHOOL ENGLISH?



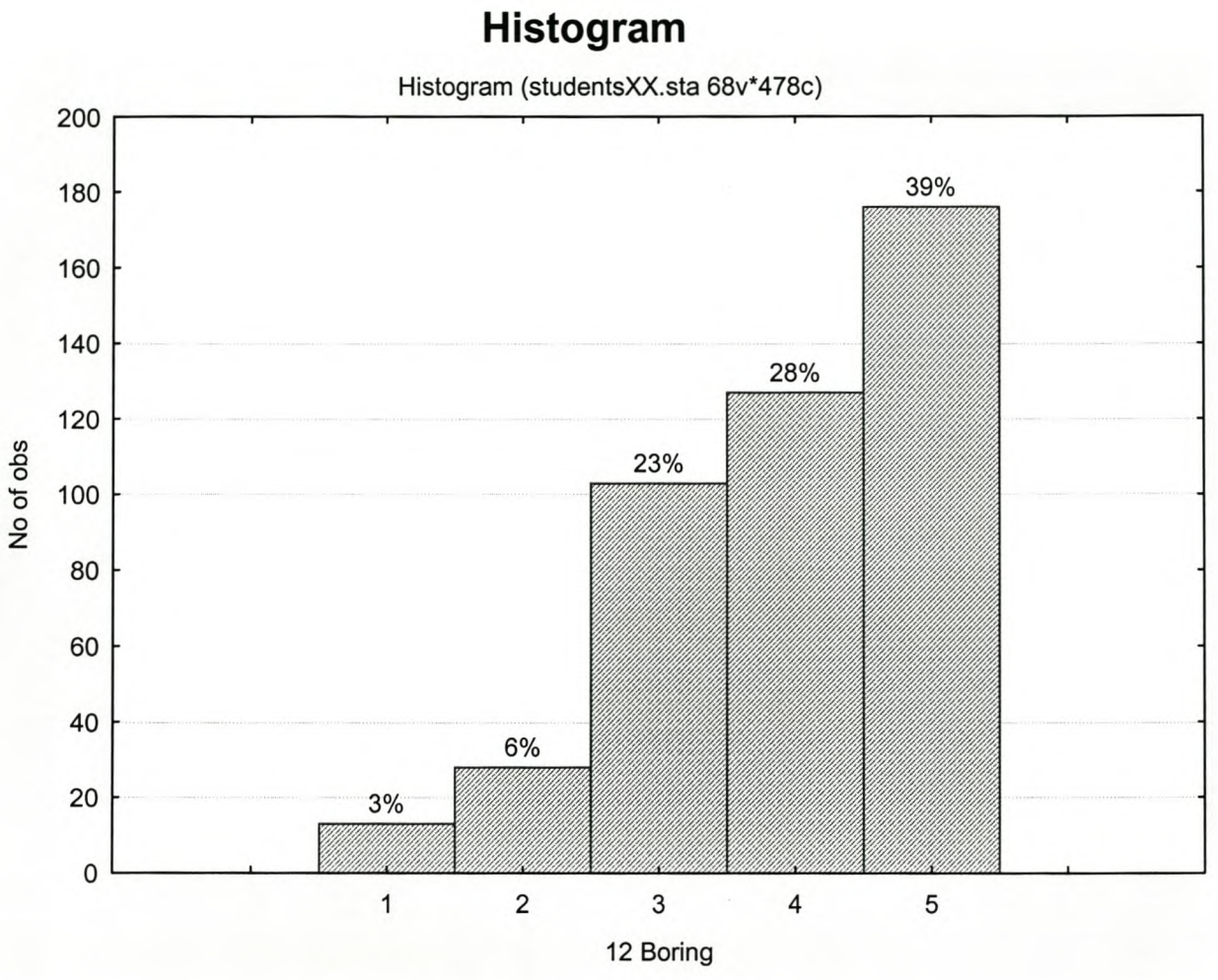
AVAILABLE OF COMPUTERS AT SCHOOL



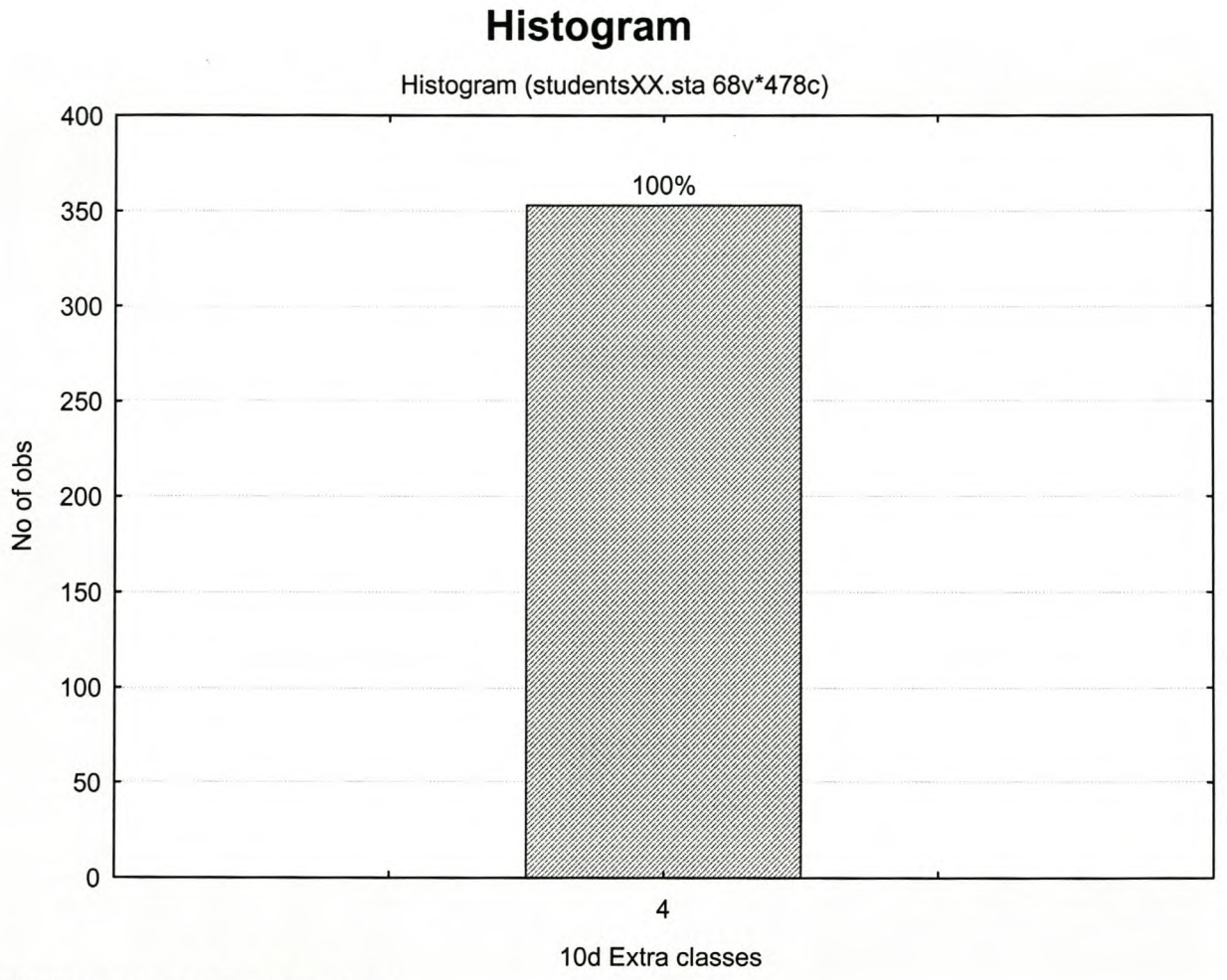
SCHOOL ACADEMIC SUPPORT



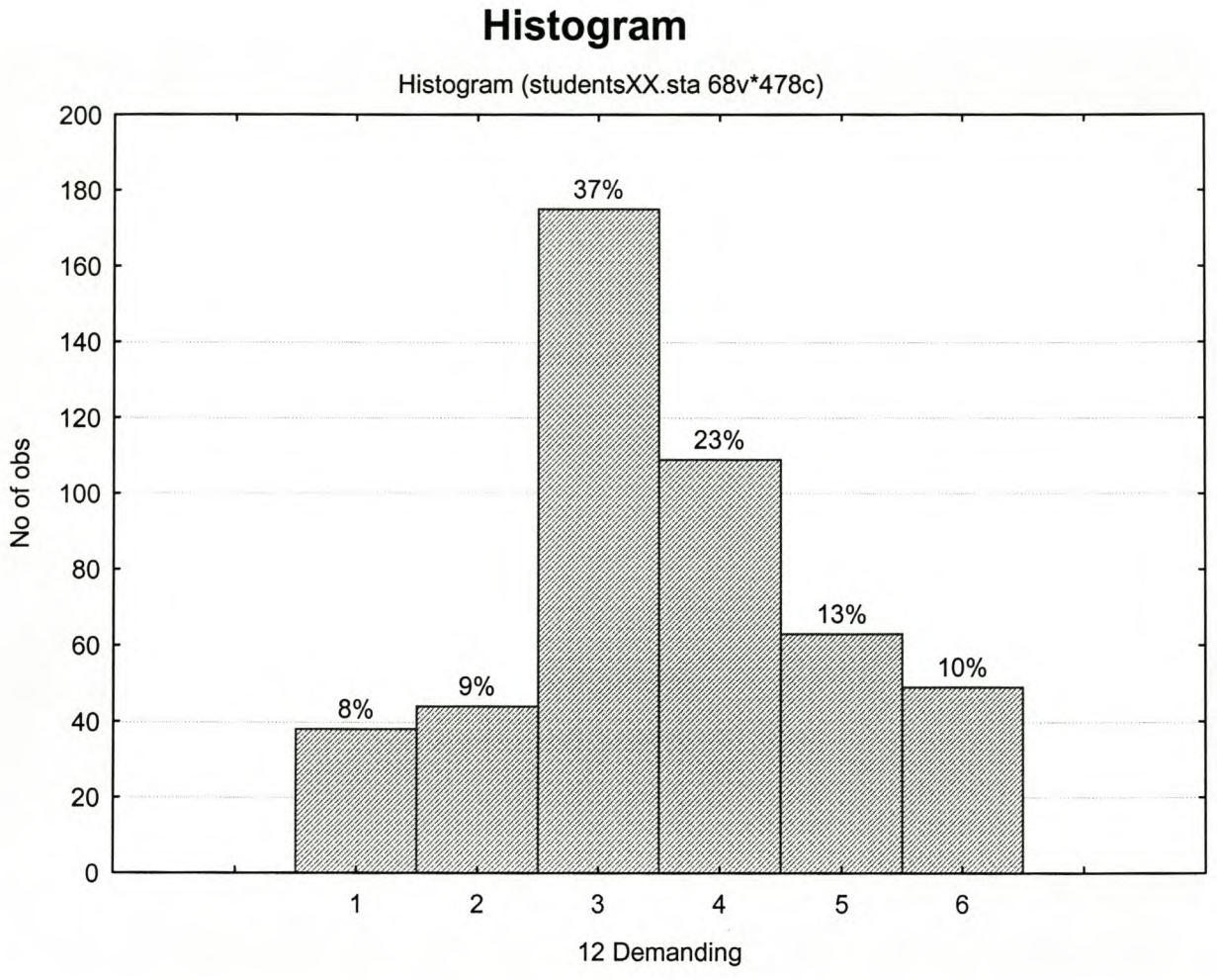
AVAILABILITY OF LANGUAGE LABORATORY AT SCHOOL



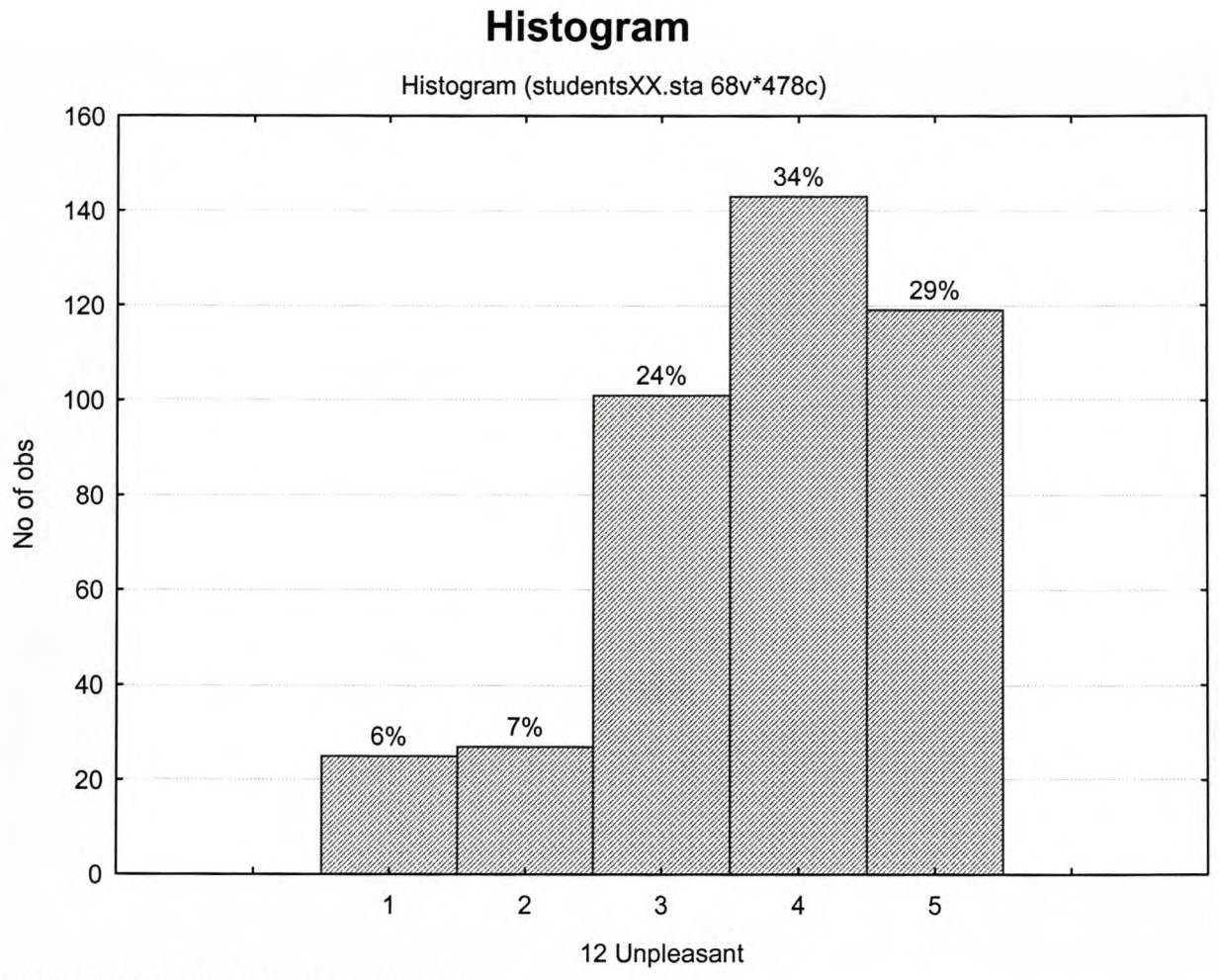
WAS SCHOOL BORING?



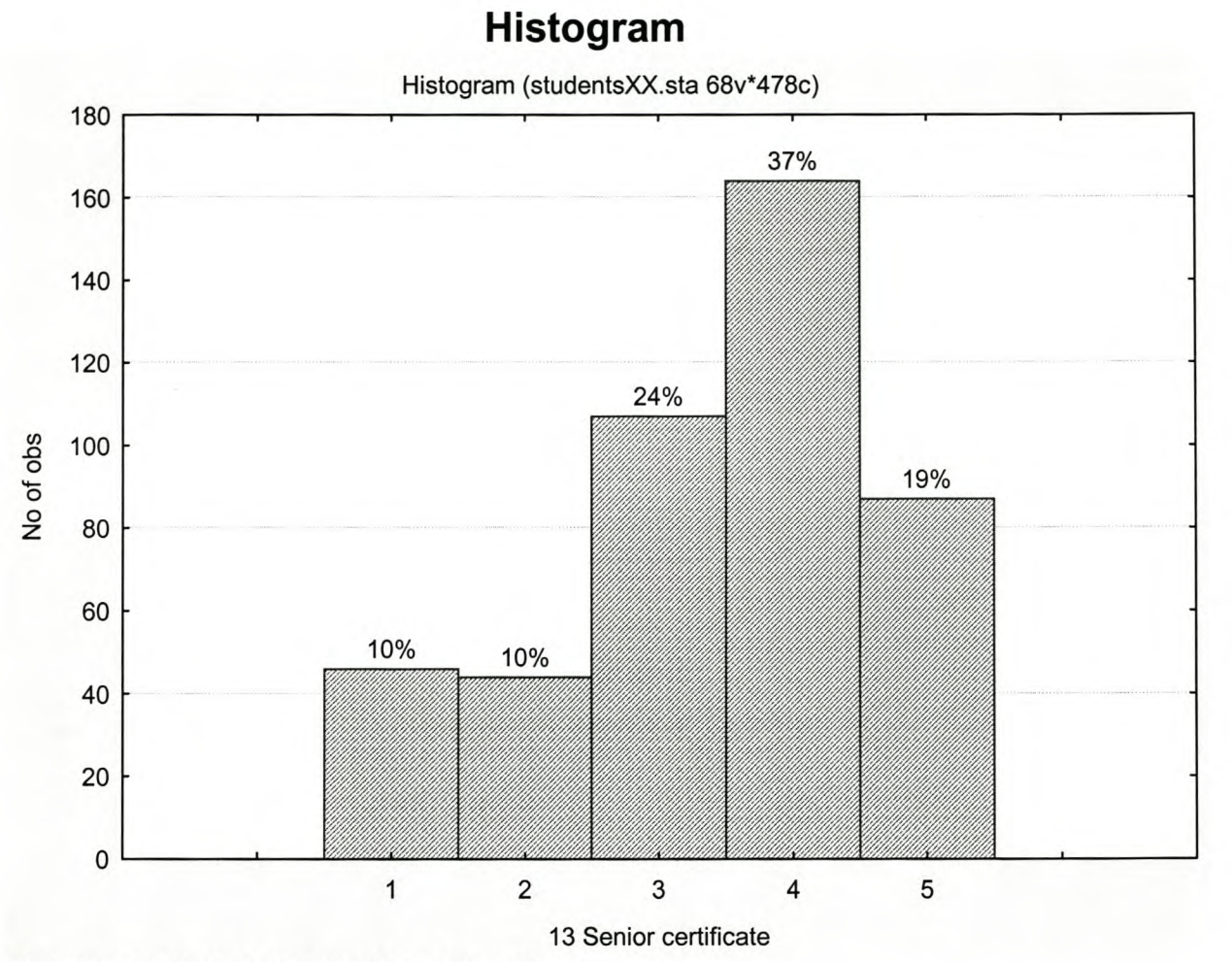
EXTRA SCHOOL CLASSES



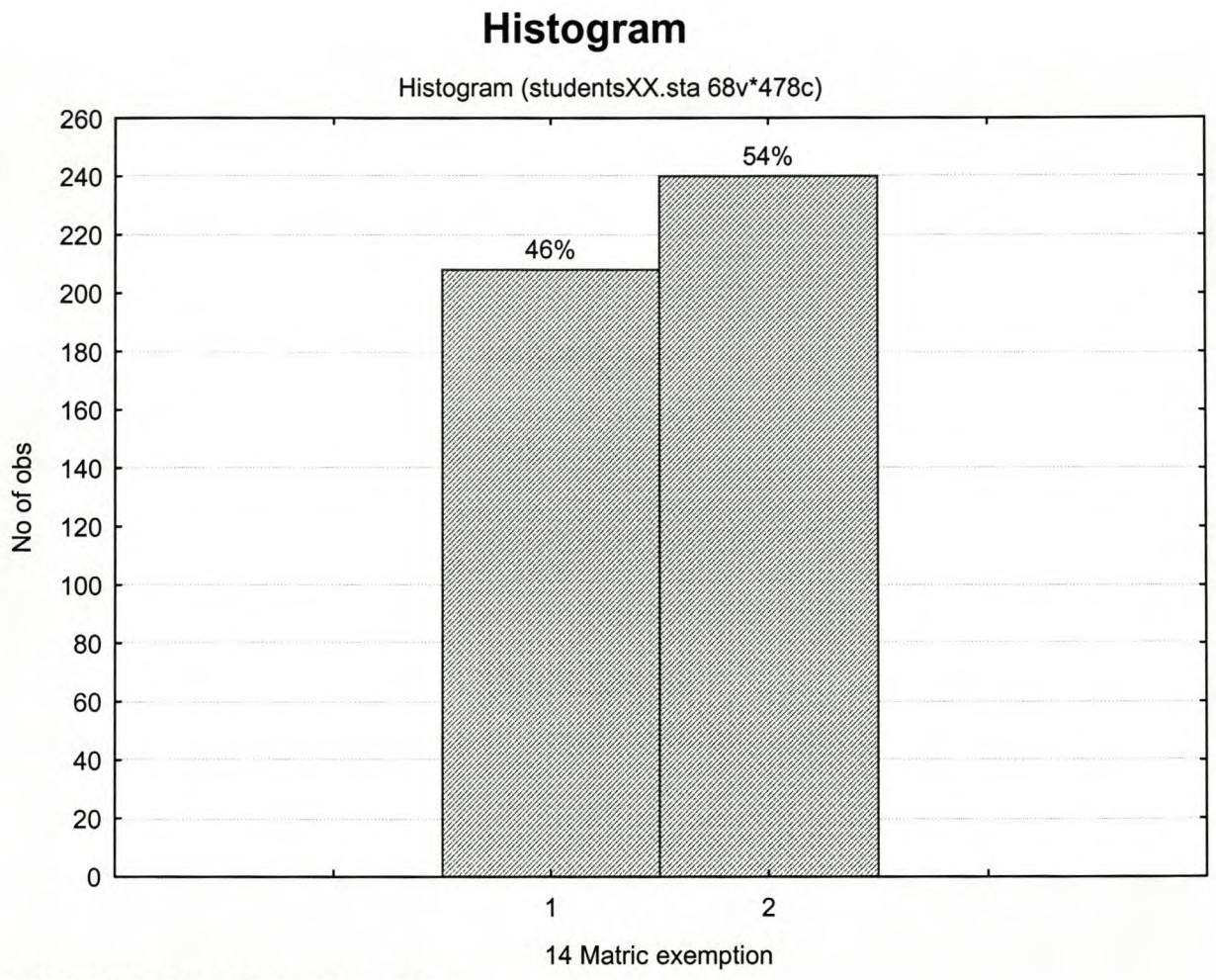
WAS SCHOOL DEMANDING?



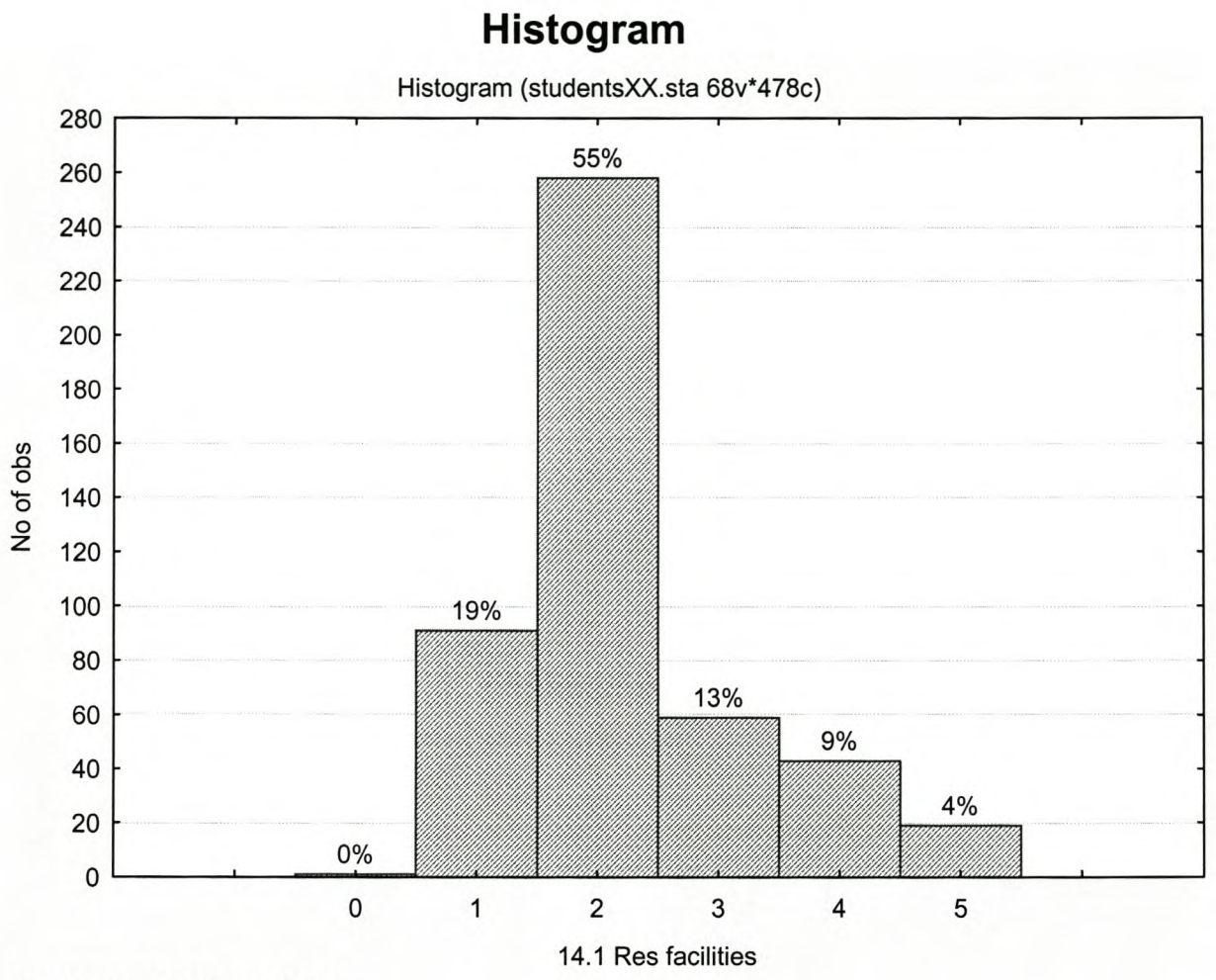
WAS SCHOOL UNPLEASANT?



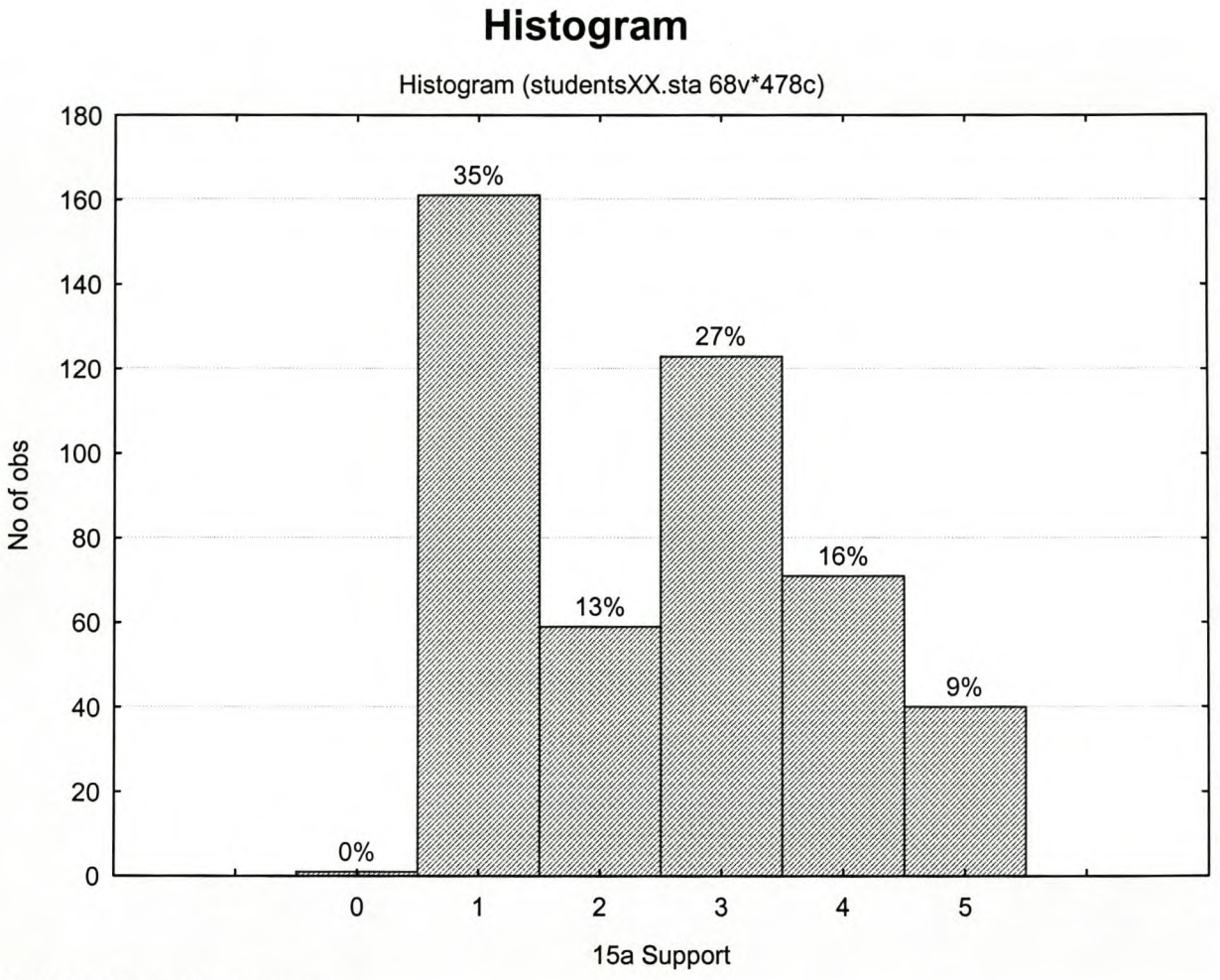
SENIOR MATRICULATION RESULTS



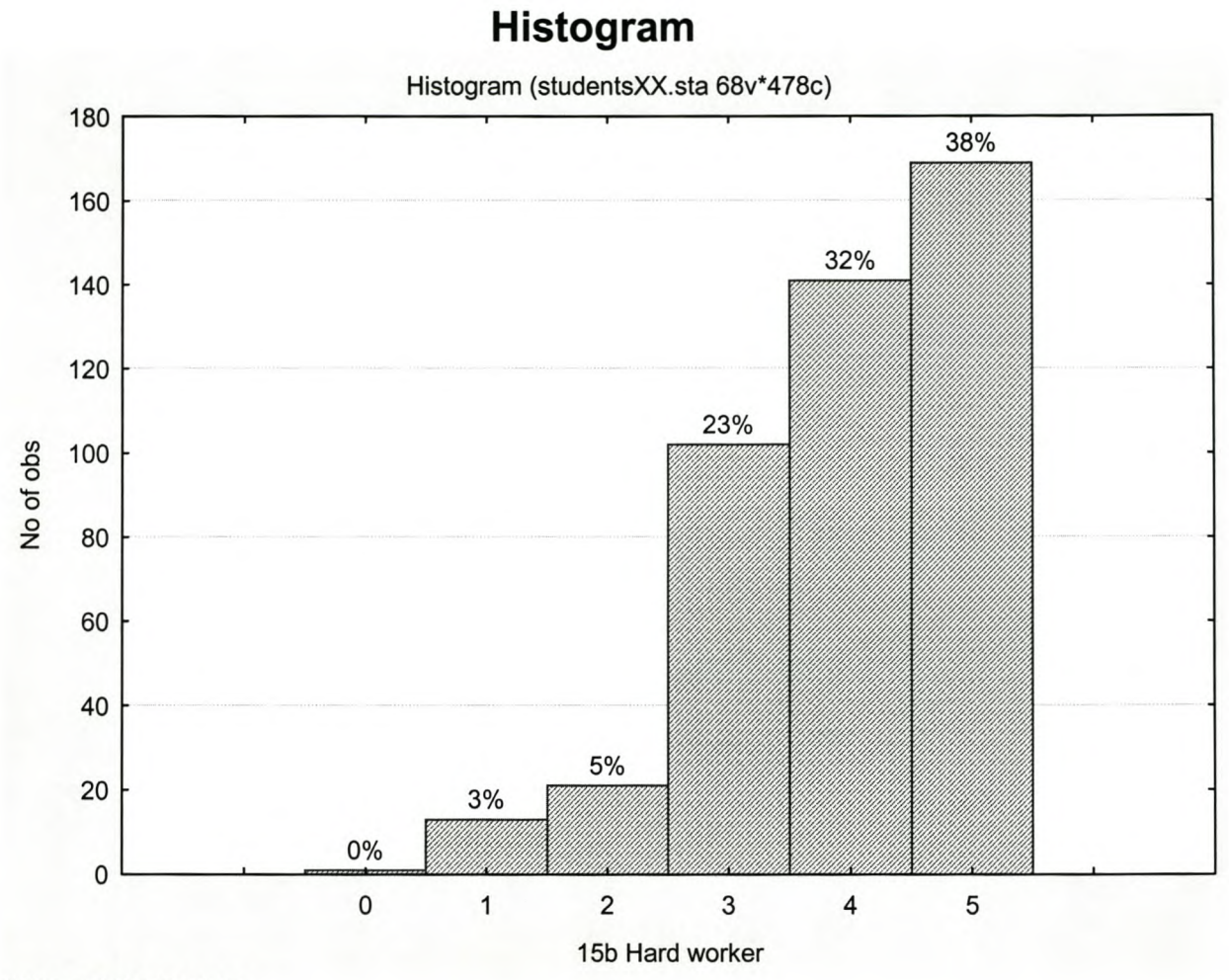
MATRICULATION EXEMPTION



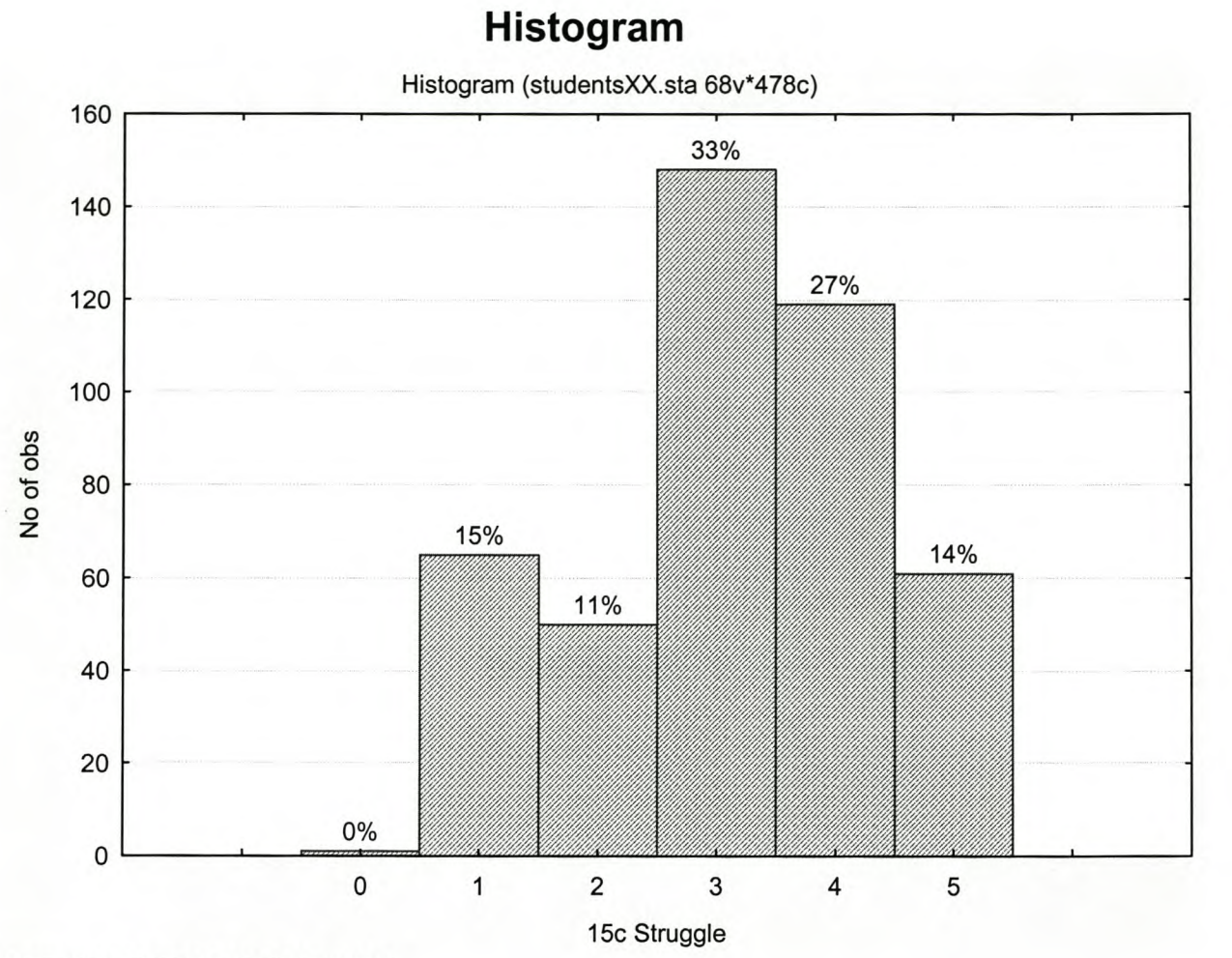
RESIDENCE FACILITIES



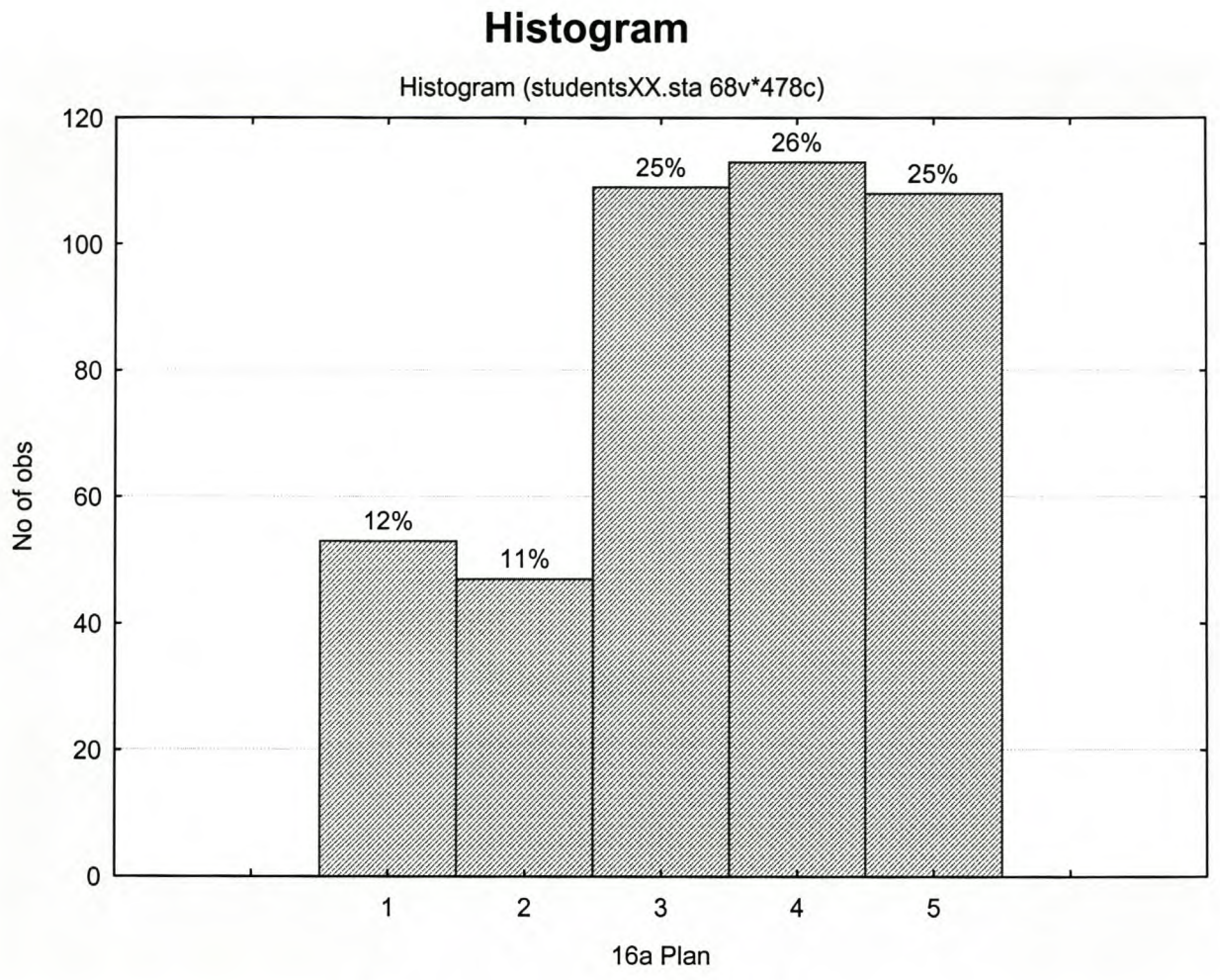
ACADEMIC SUPPORT



HARD WORKER

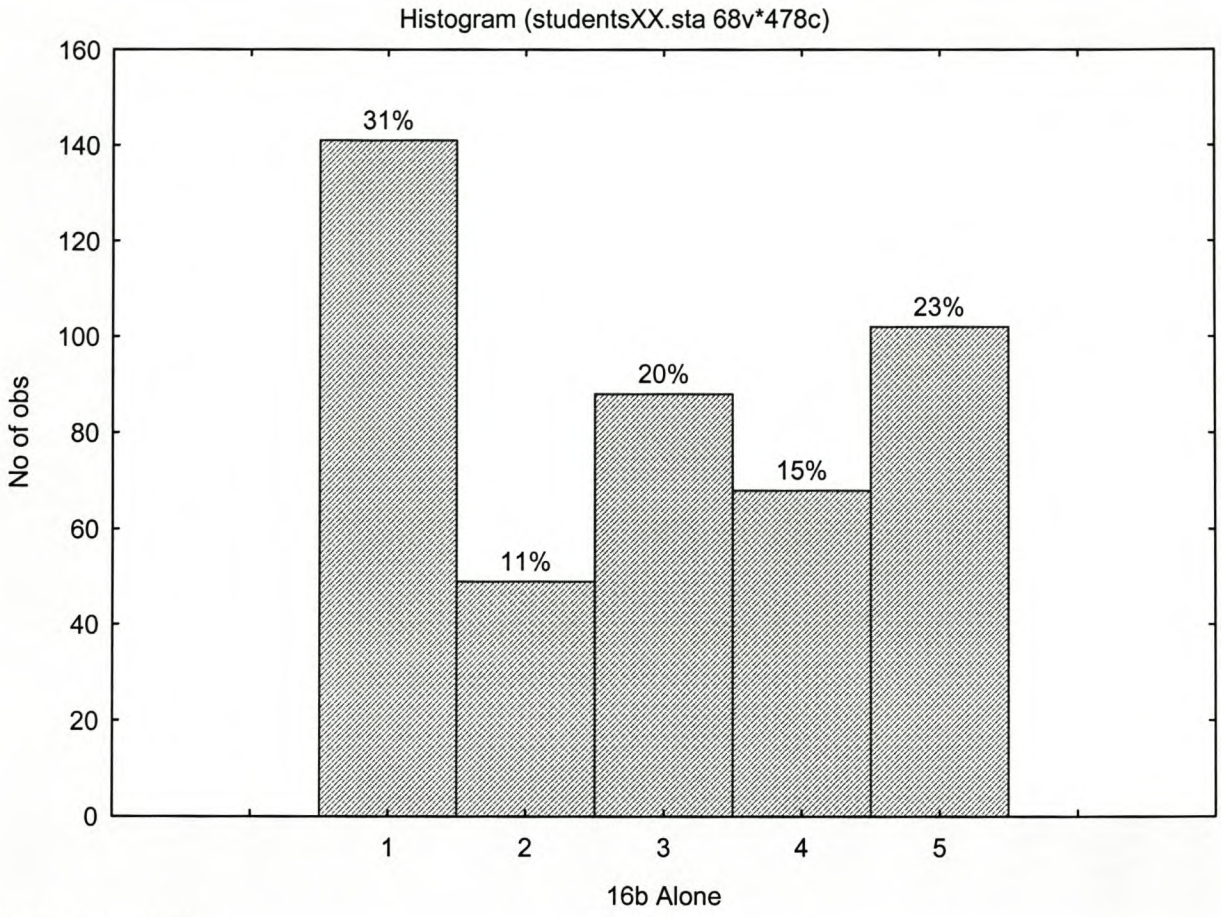


STRUGGLE TO CATCH UP

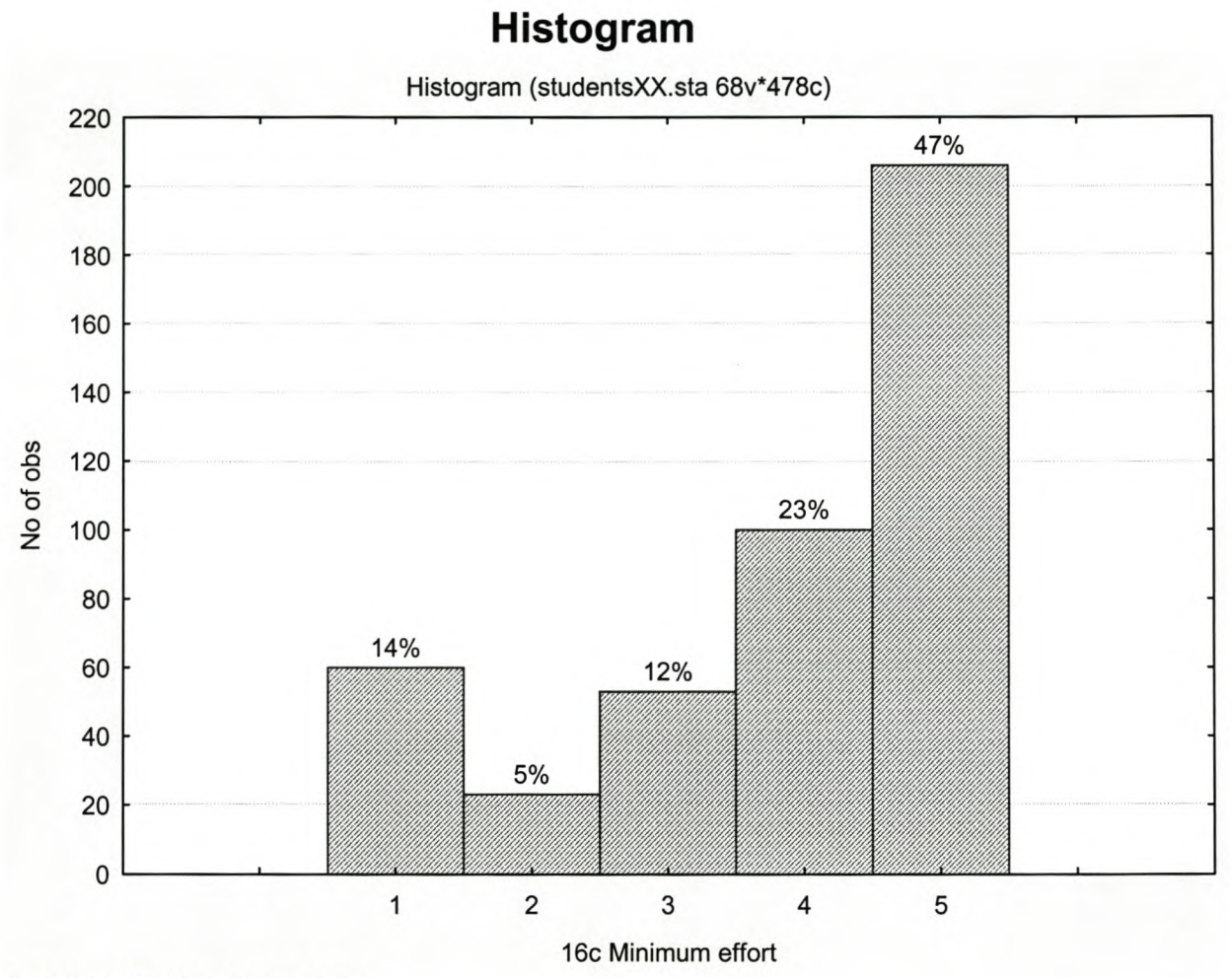


WORK ACCORDING TO A PLAN

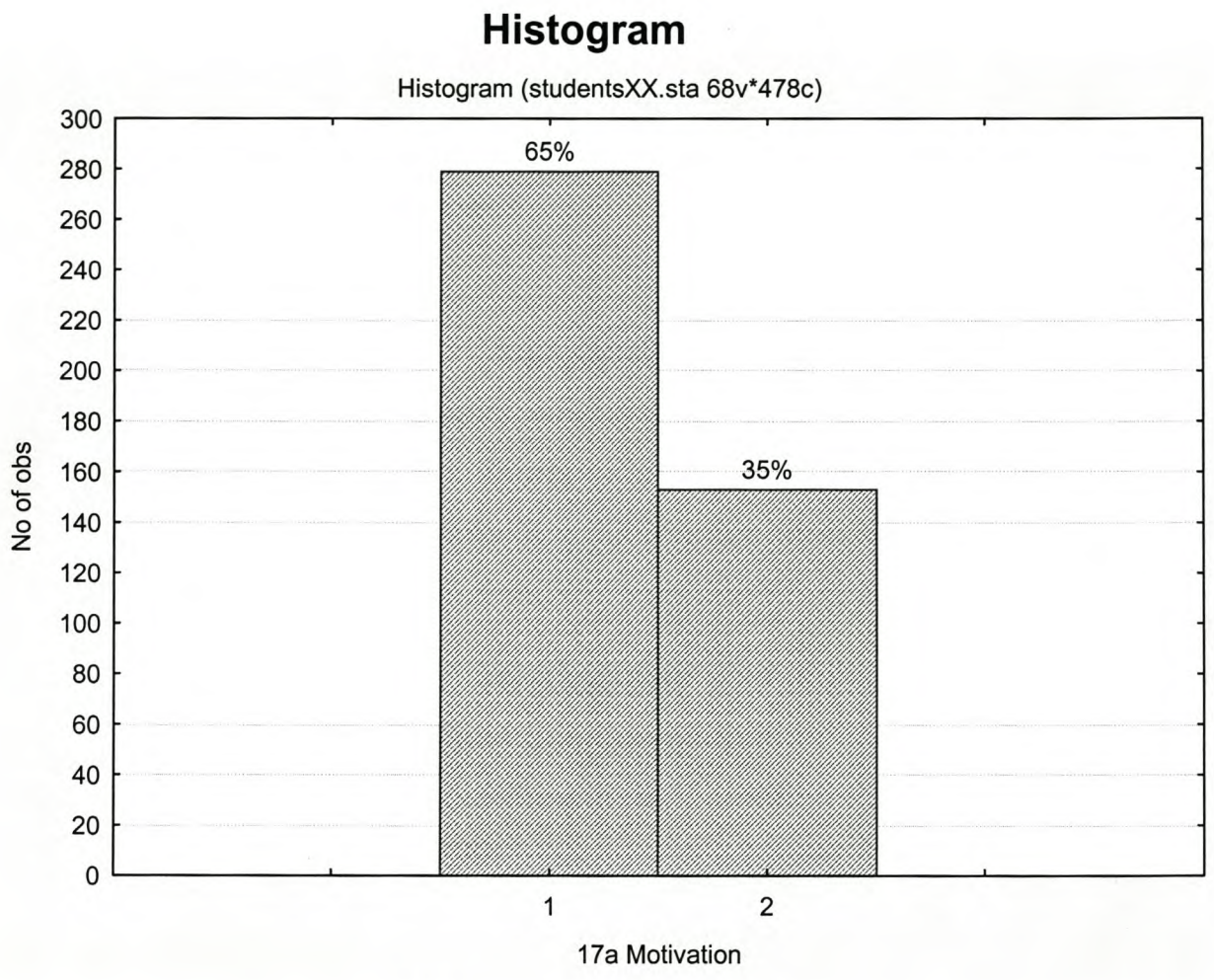
Histogram



WORK ALONE

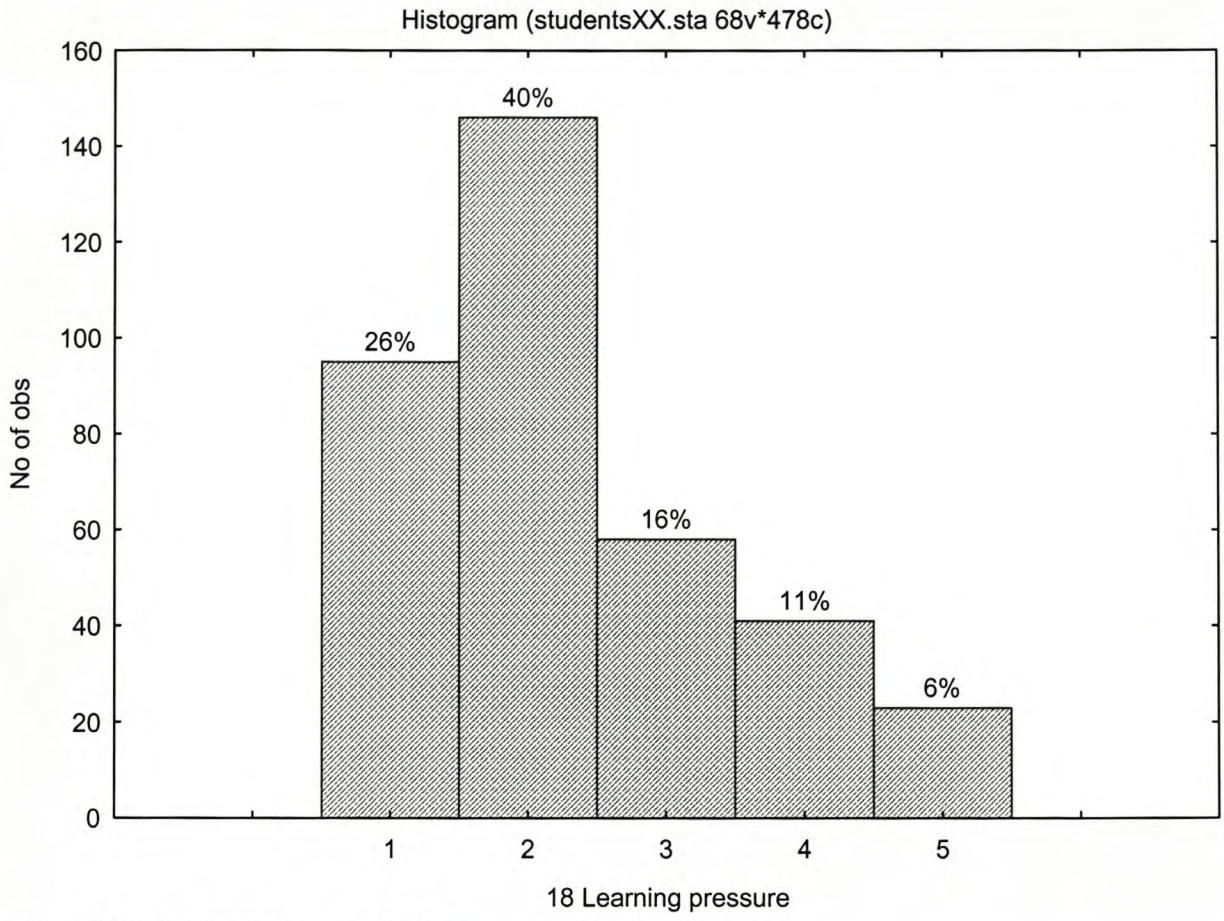


USE MINIMUM EFFORT

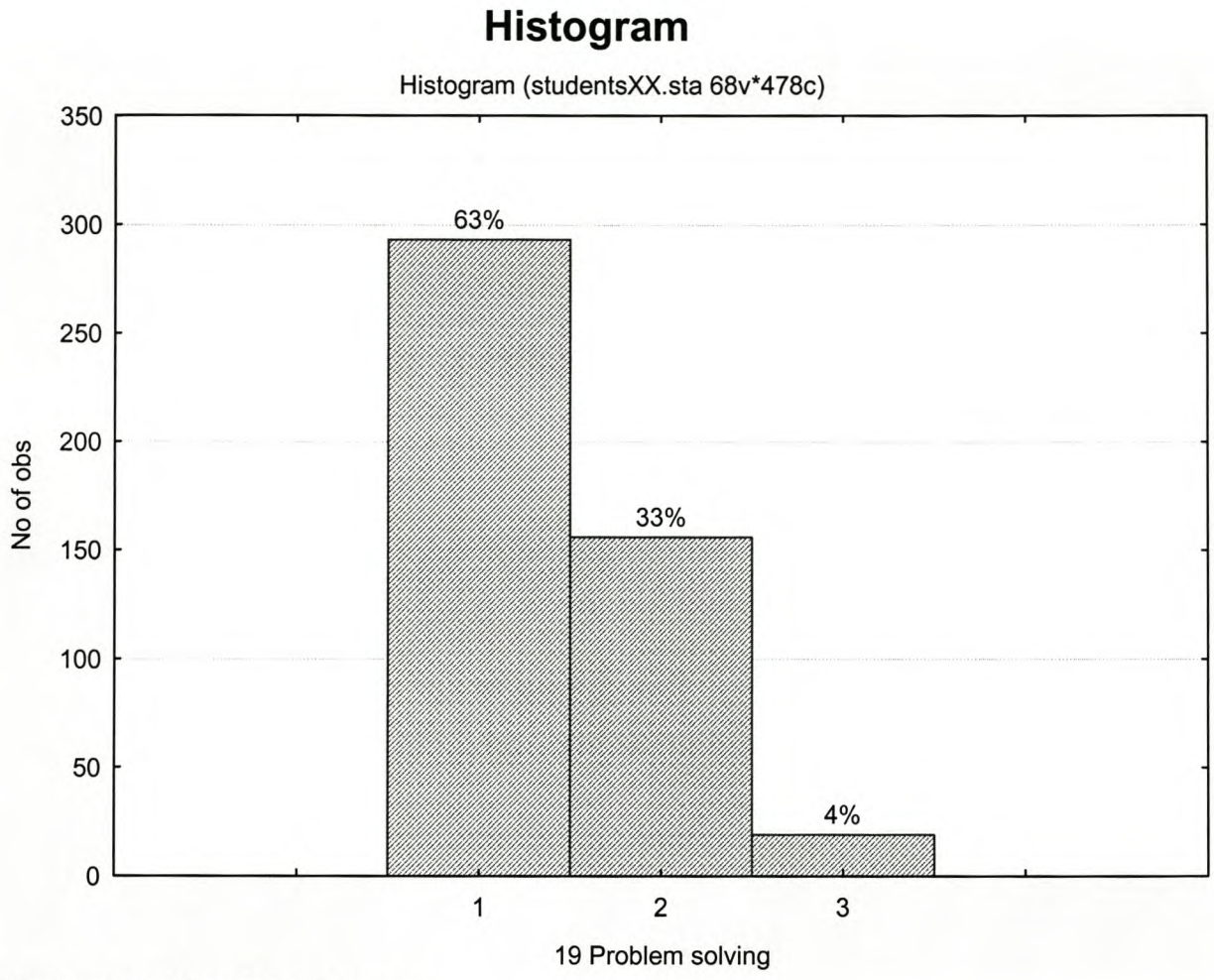


MOTIVATED LEARNER

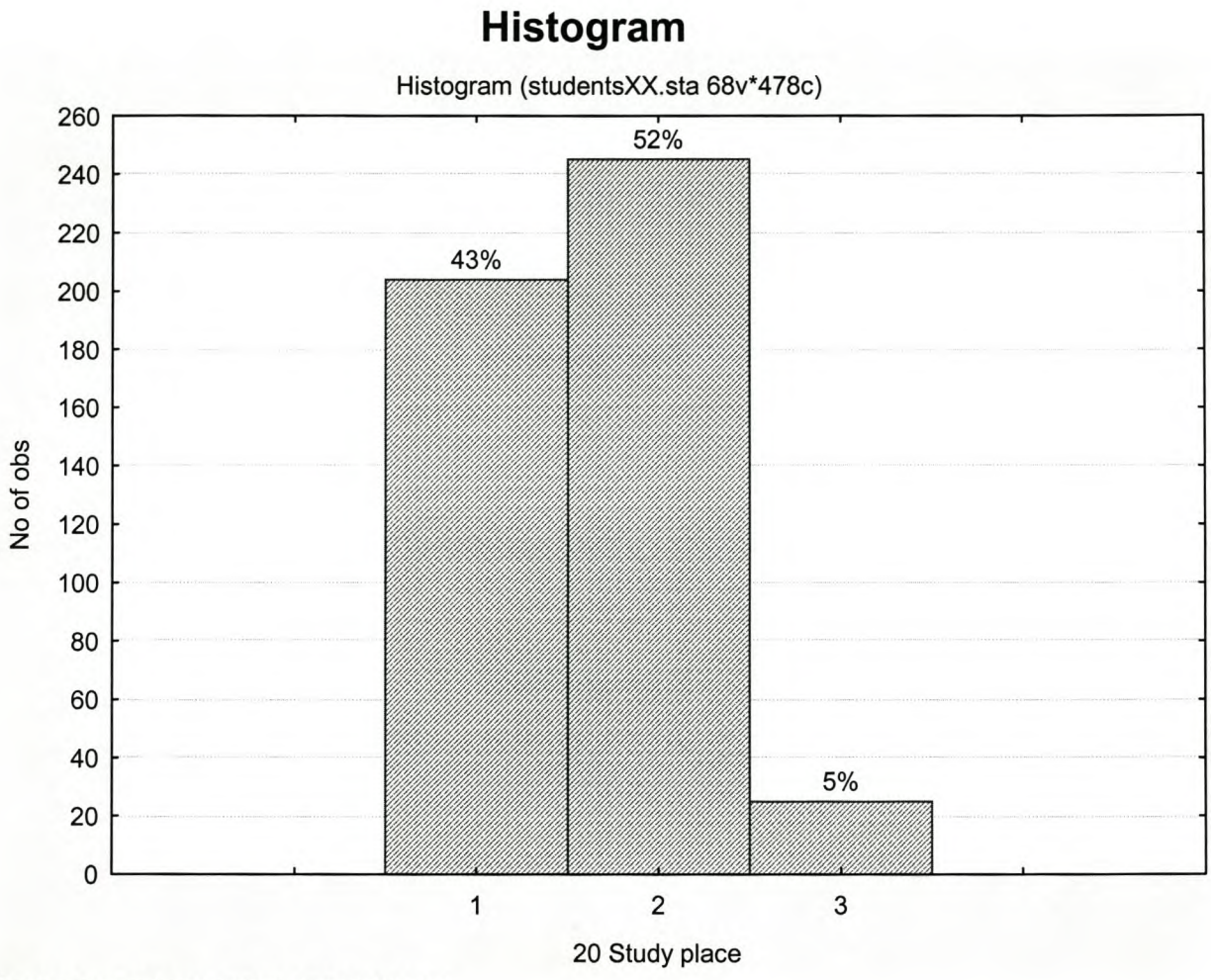
Histogram



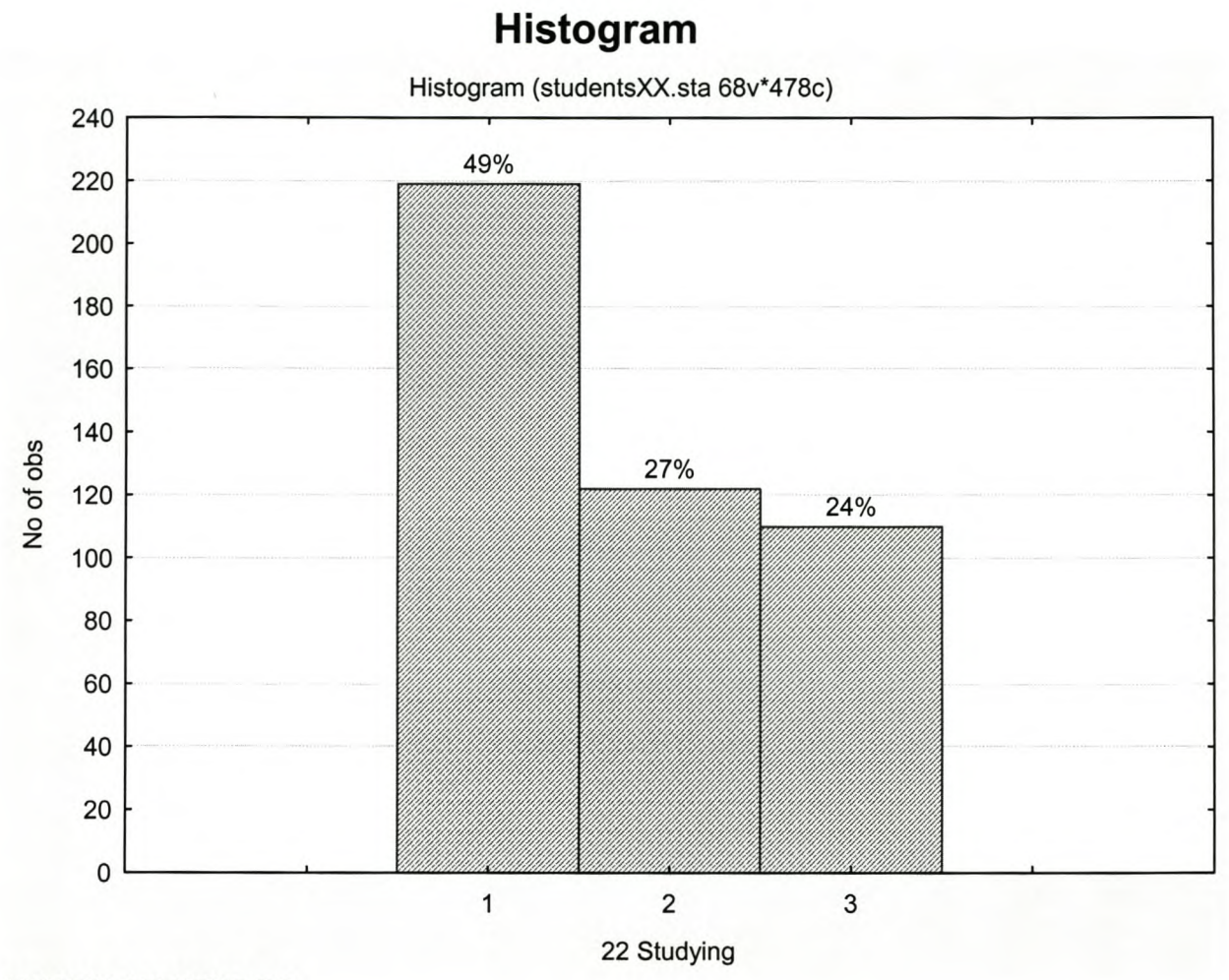
LEARNING UNDER PRESSURE



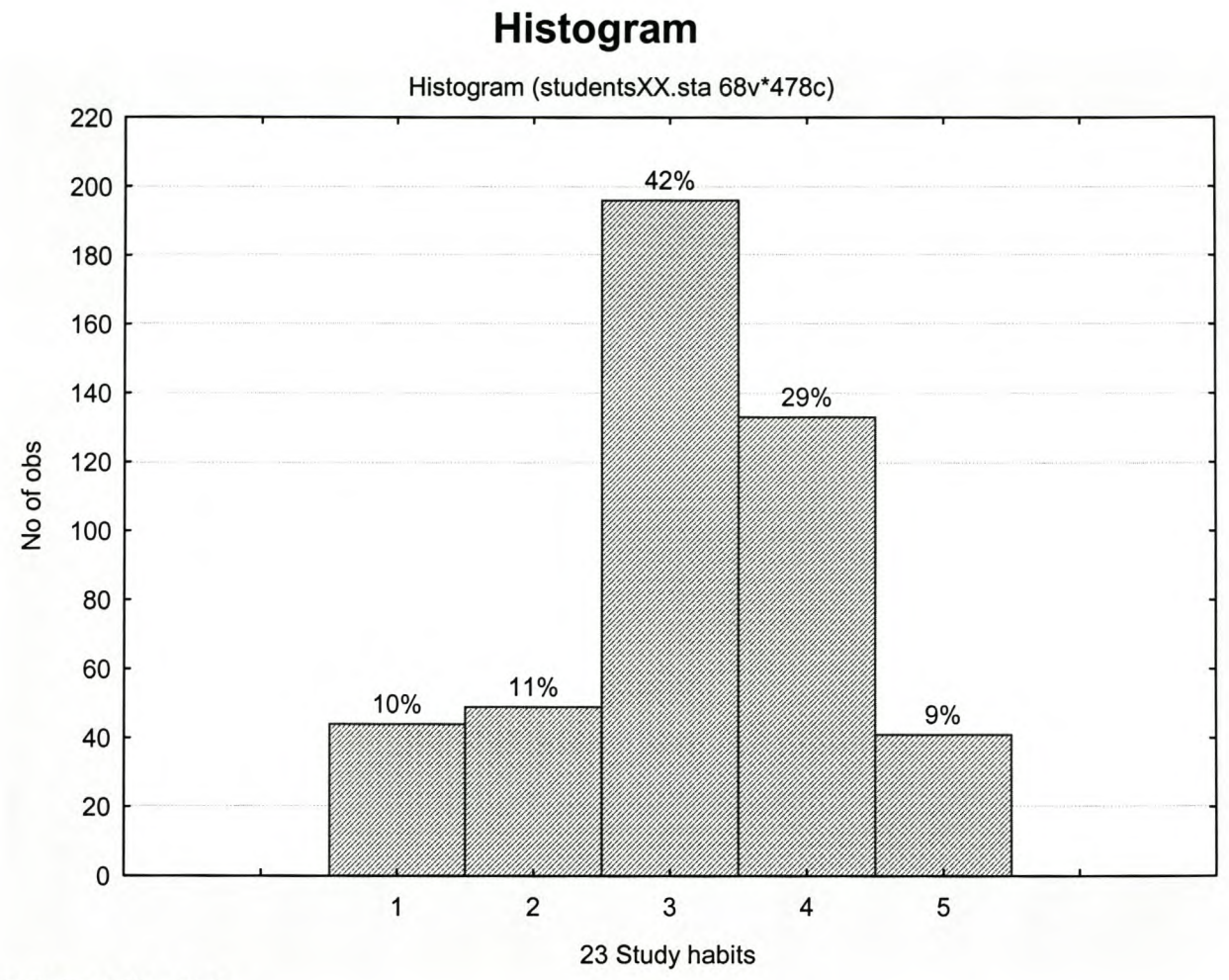
PROBLEM SOLVING SKILLS



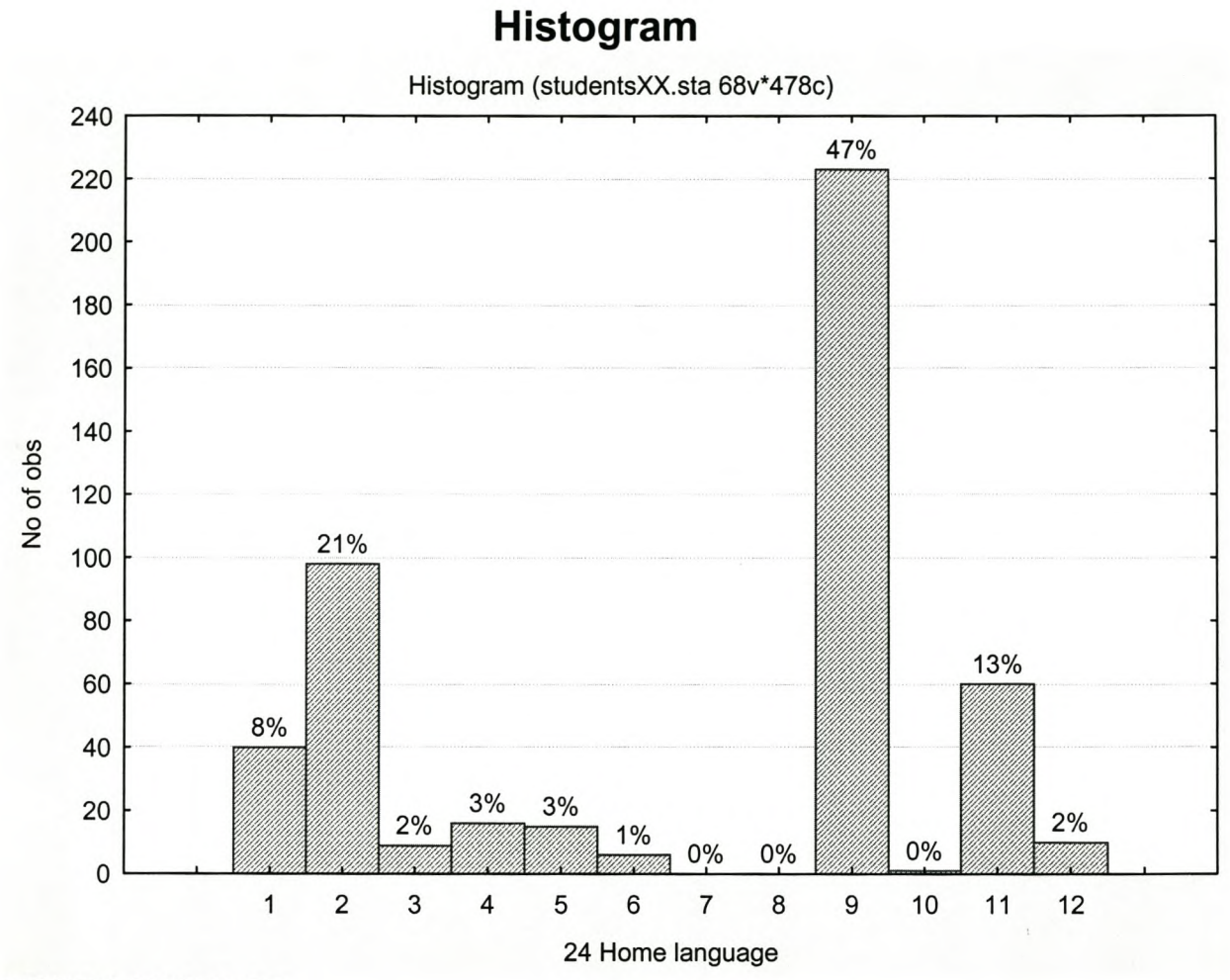
PREFERED PLACE OF STUDY



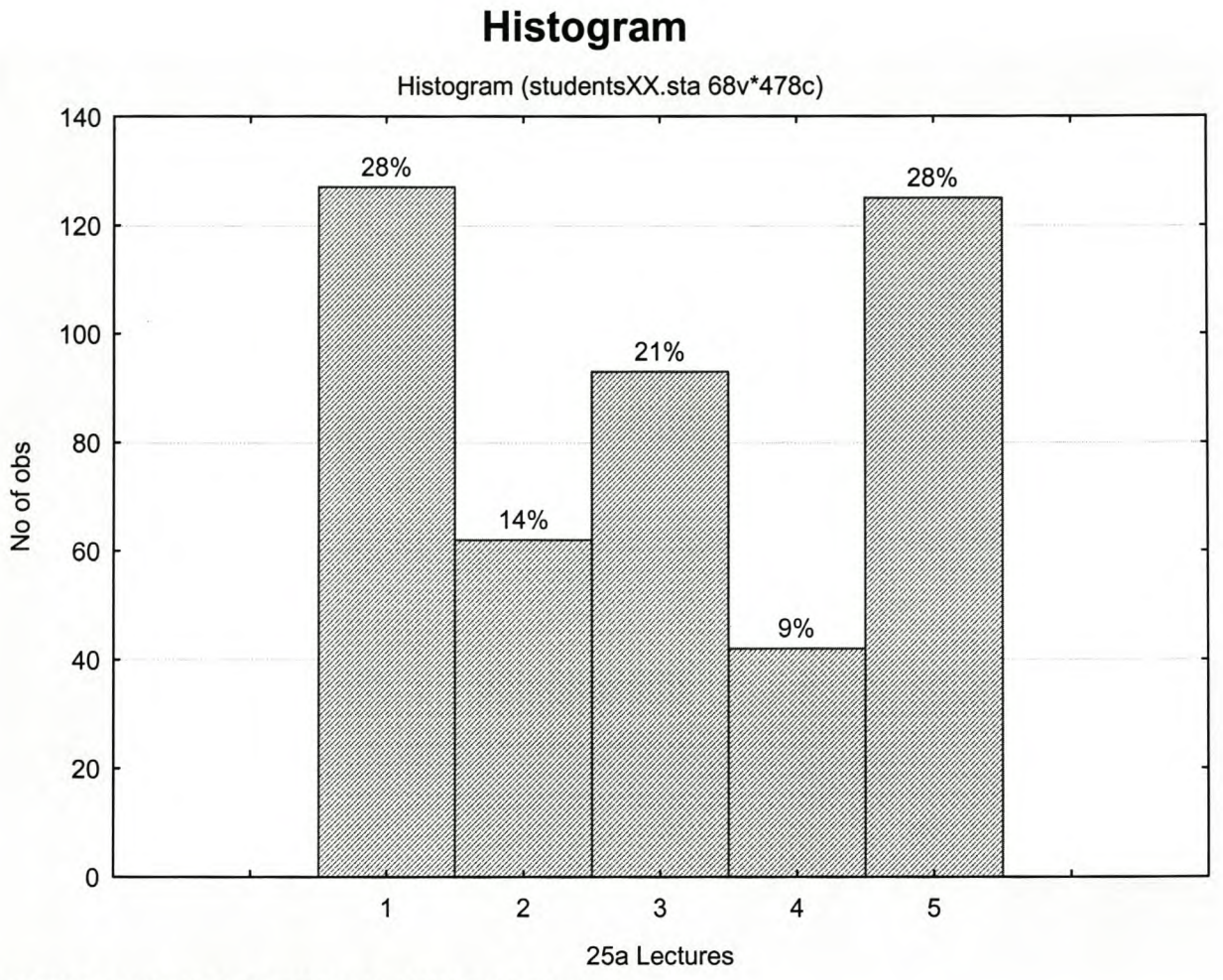
STUDY ATTITUDES



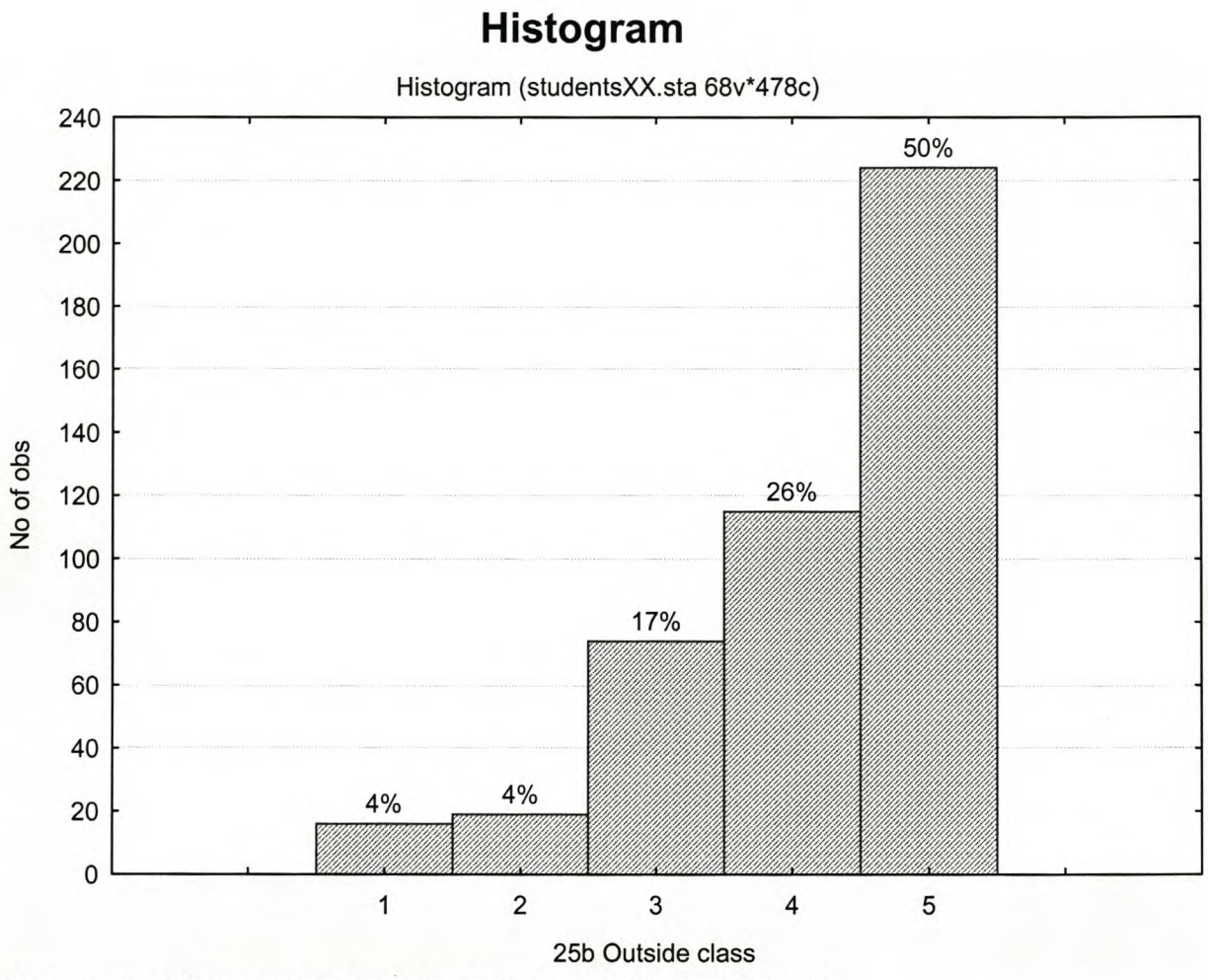
STUDY HABITS



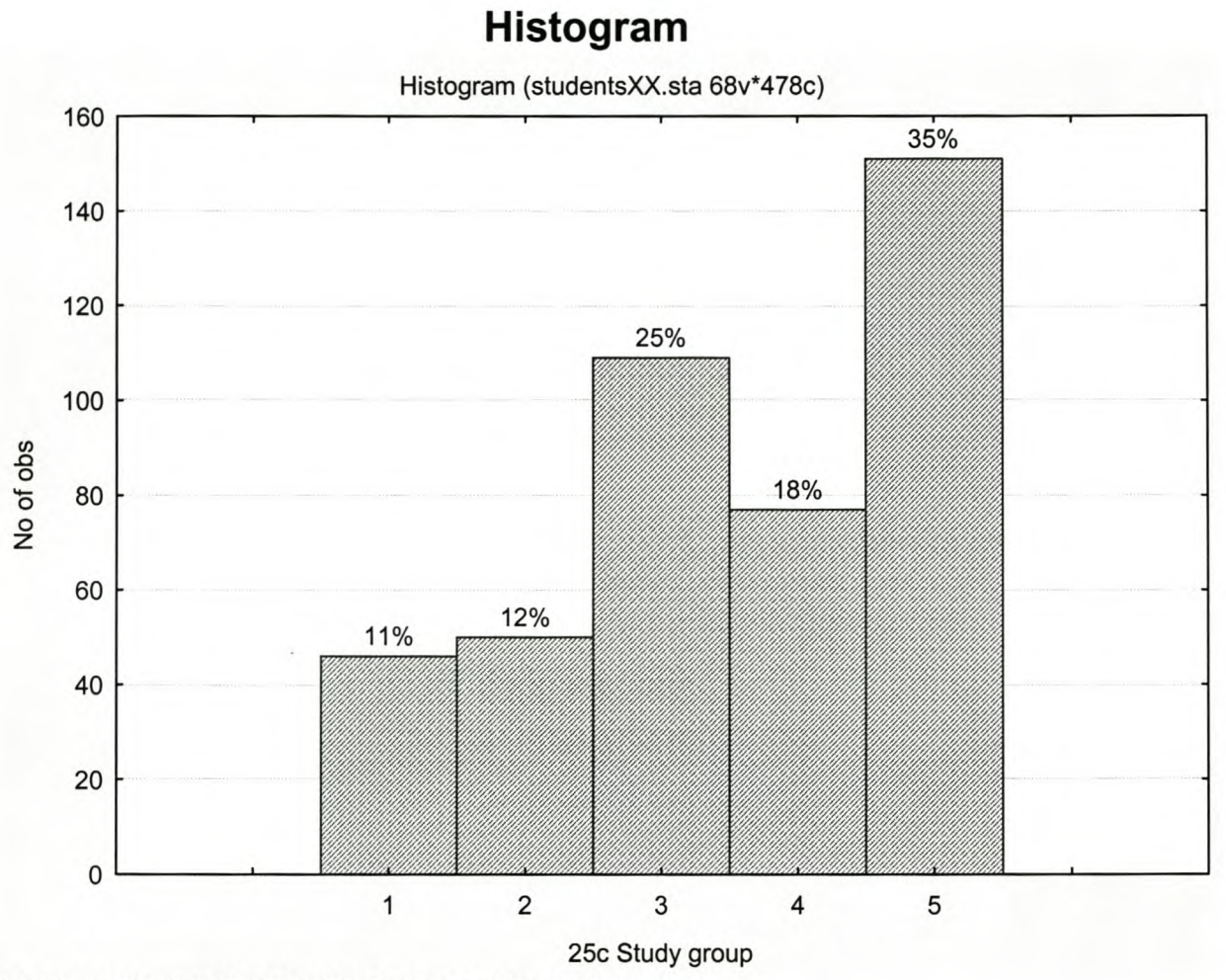
HOME LANGUAGE



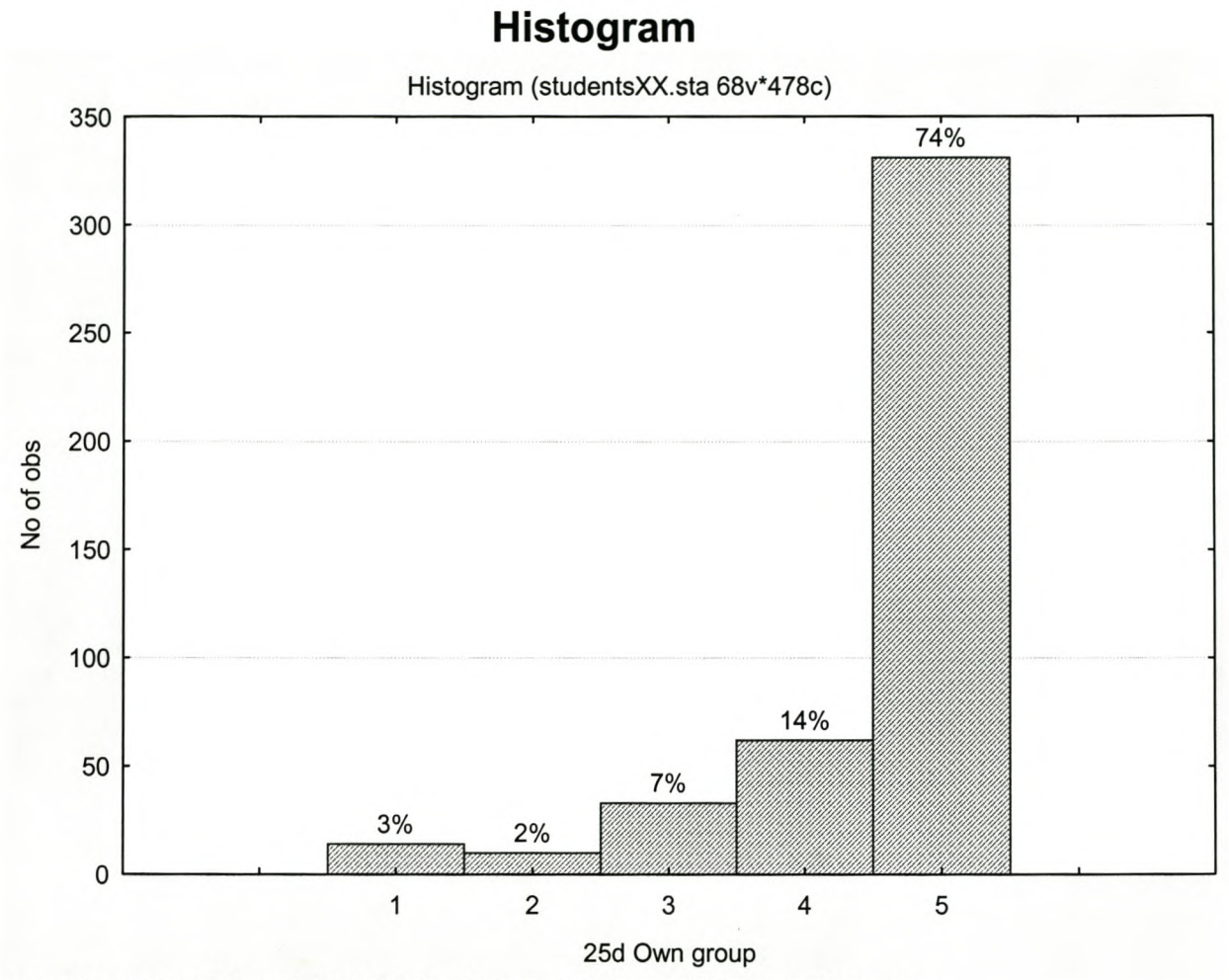
USE OF HOME LANGUAGE IN LECTURES



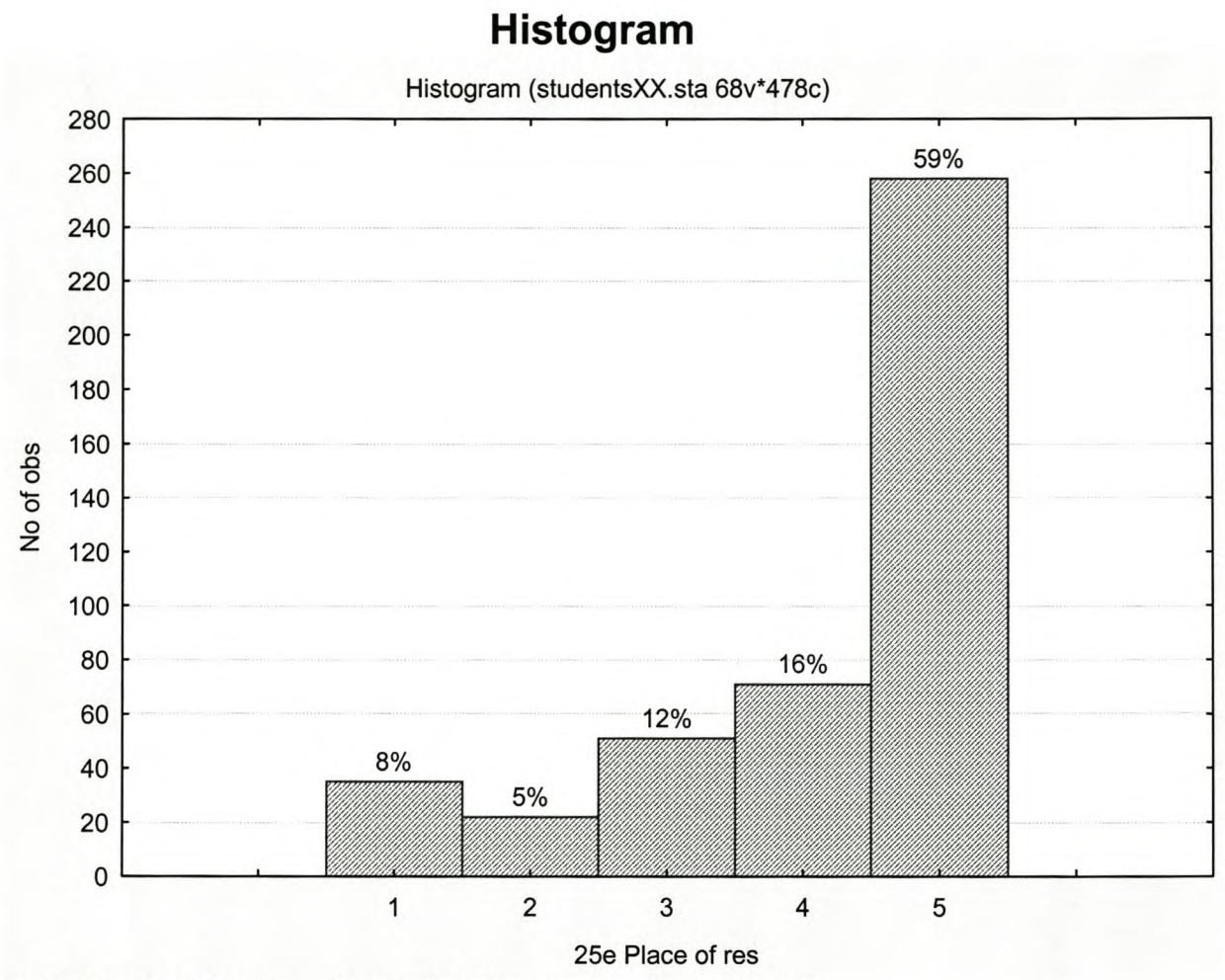
USE OF HOME LANGUAGE OUTSIDE THE CLASSROOM



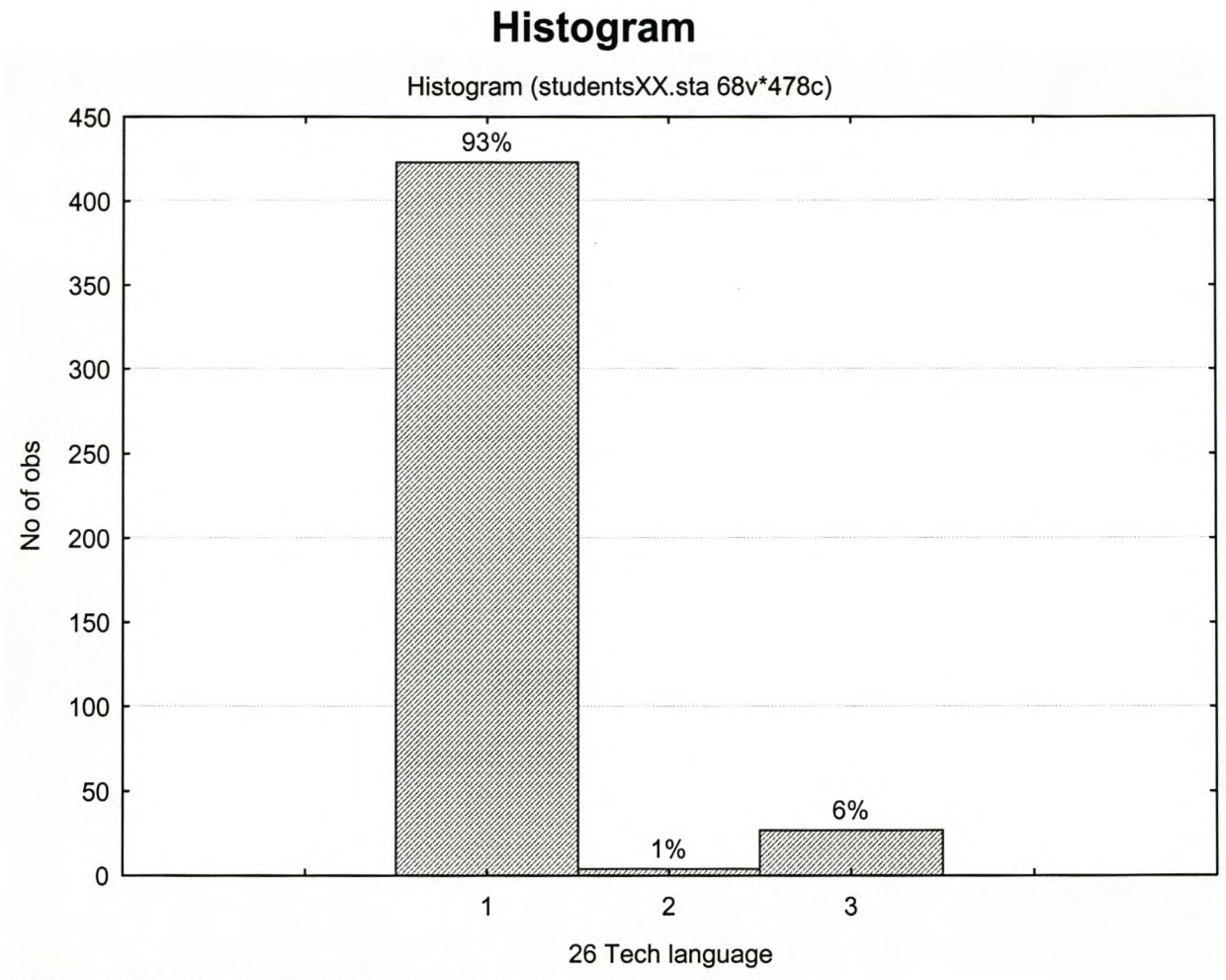
USE OF HOME LANGUAGE IN STUDY GROUPS



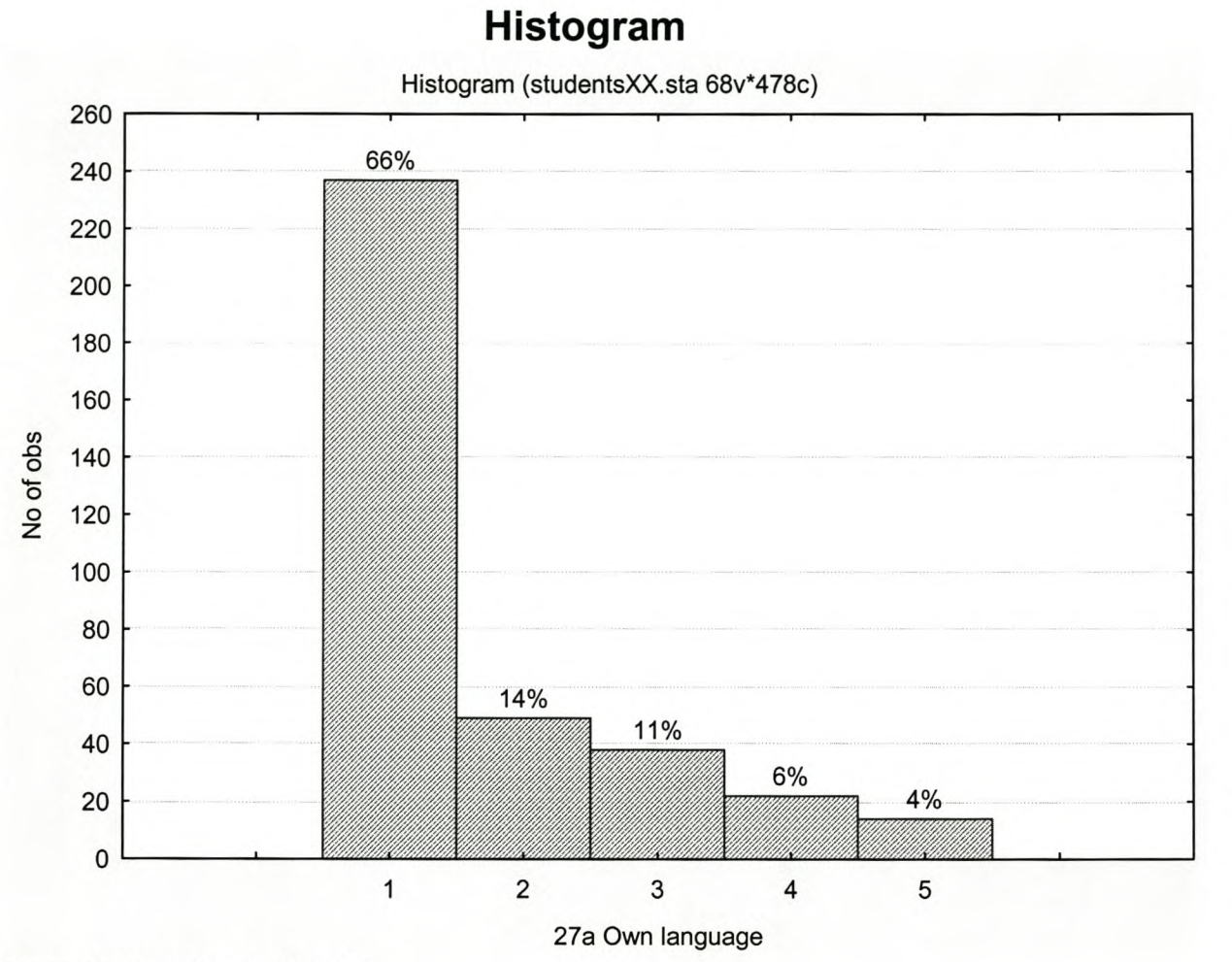
USE OF HOME LANGUAGE IN SELF CONSTITUTED GROUPS



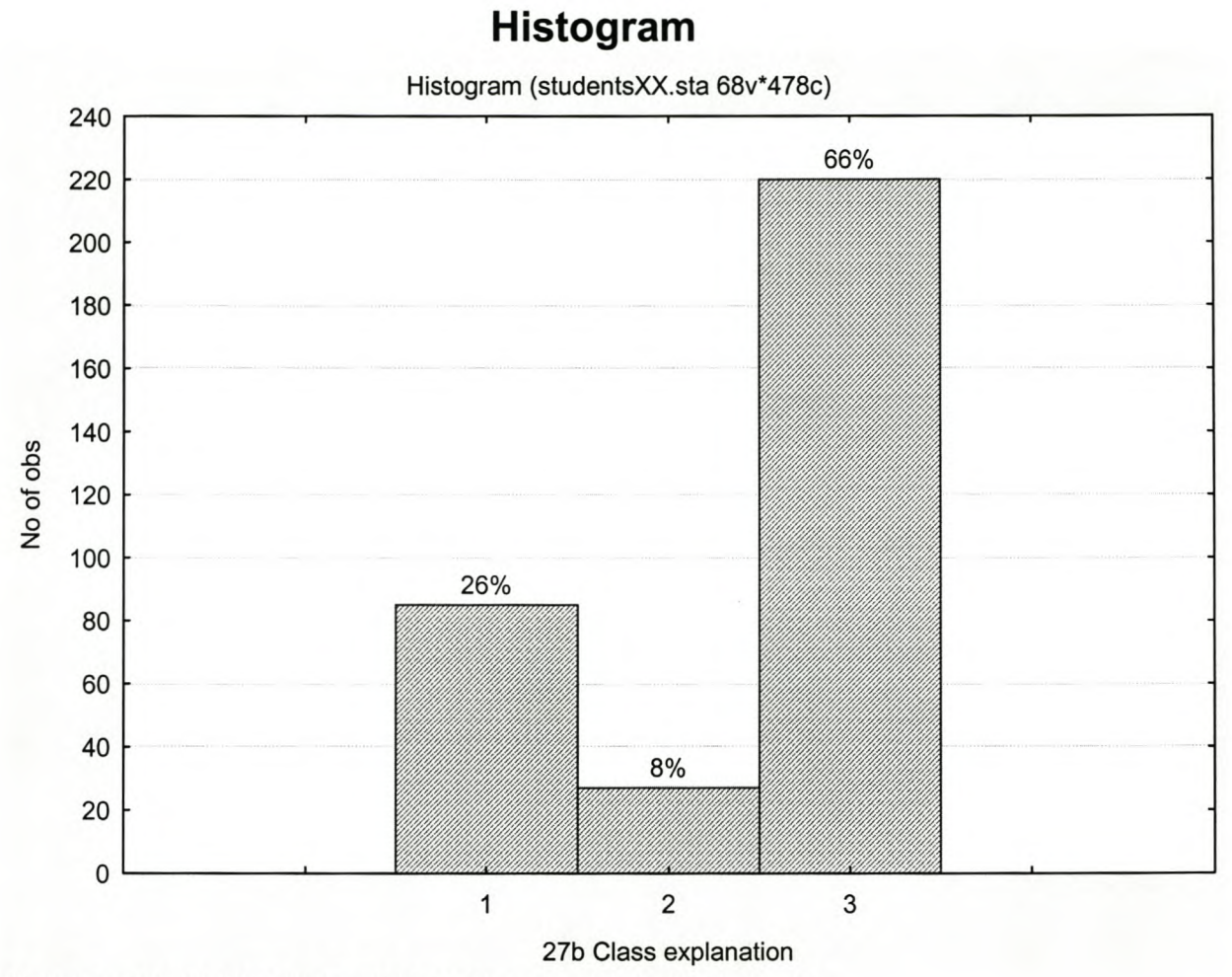
USE OF HOME LANGUAGE AT PLACE OF RESIDENCE



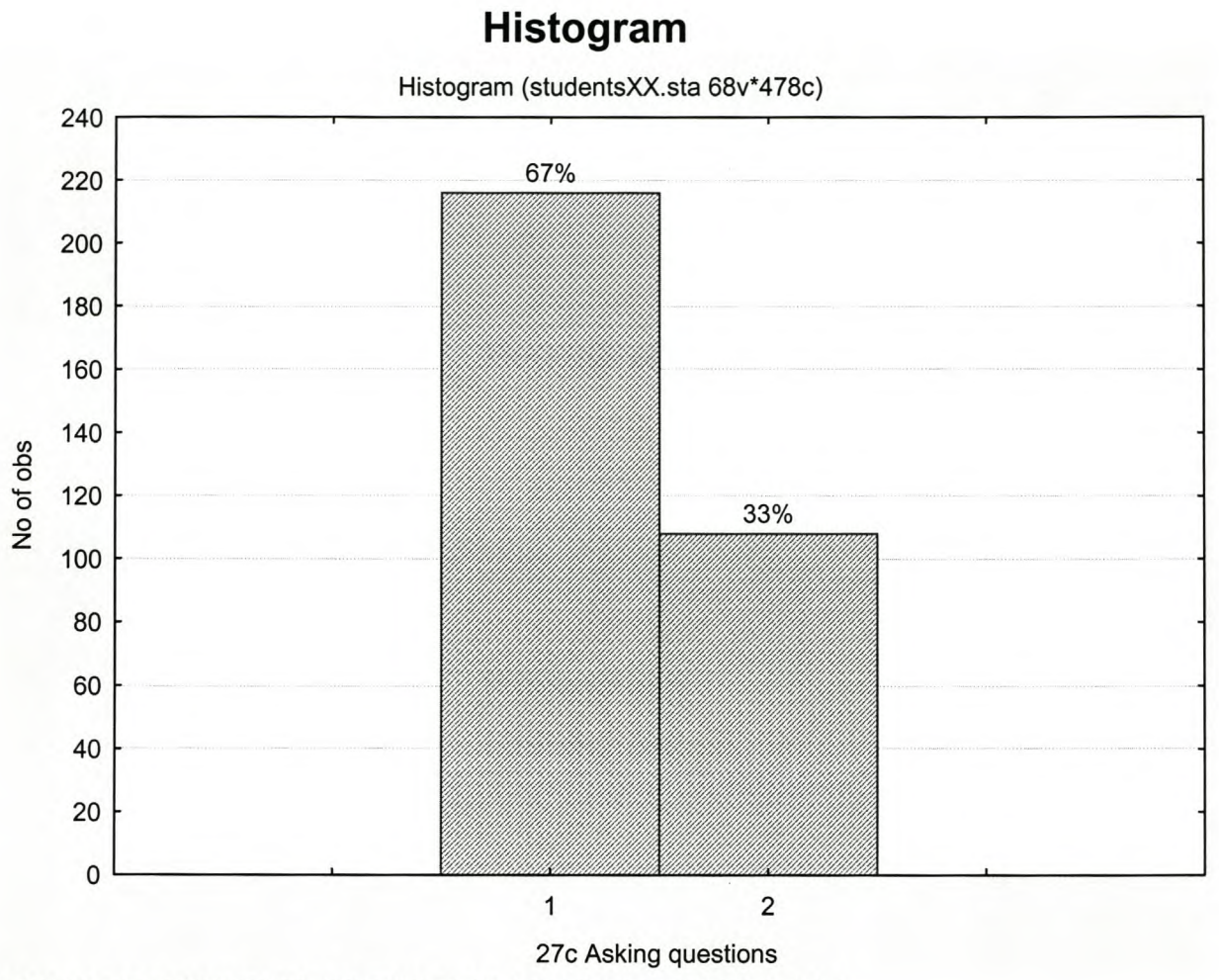
USE OF TECHNIKON MEDIUM OF INSTRUCTION



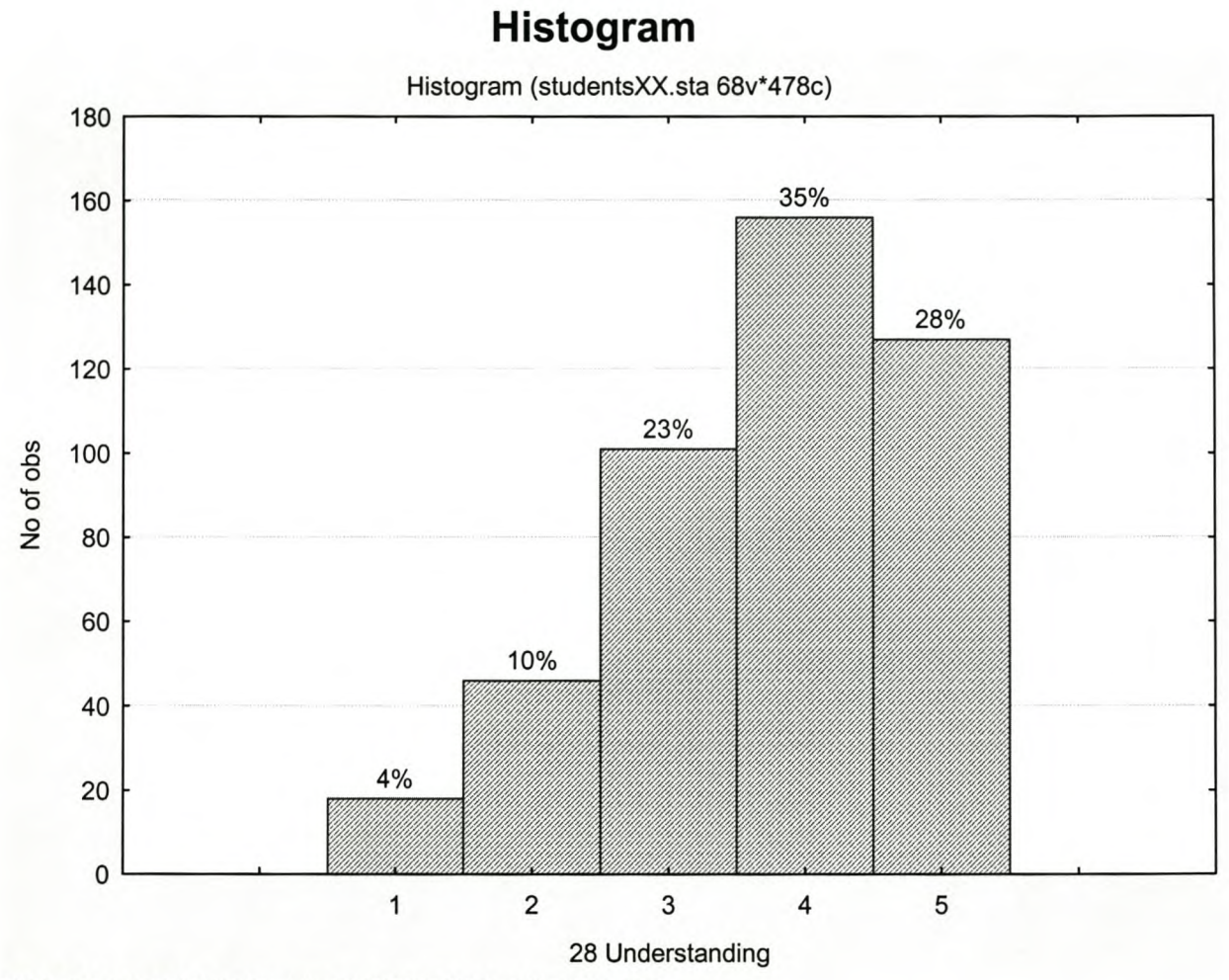
USE OF OWN LANGUAGE



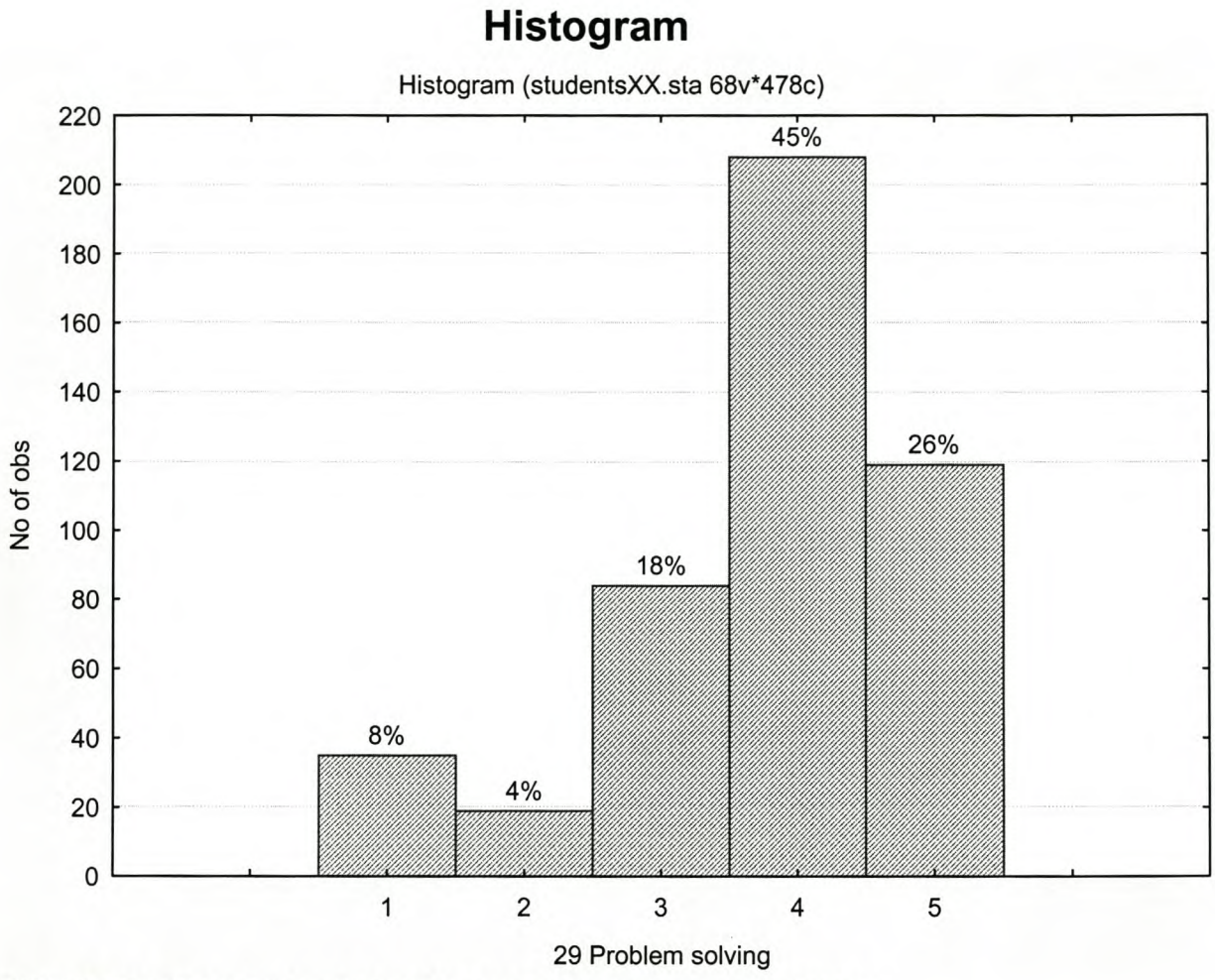
USING OWN LANGUAGE FOR CLASS EXPLANATIONS



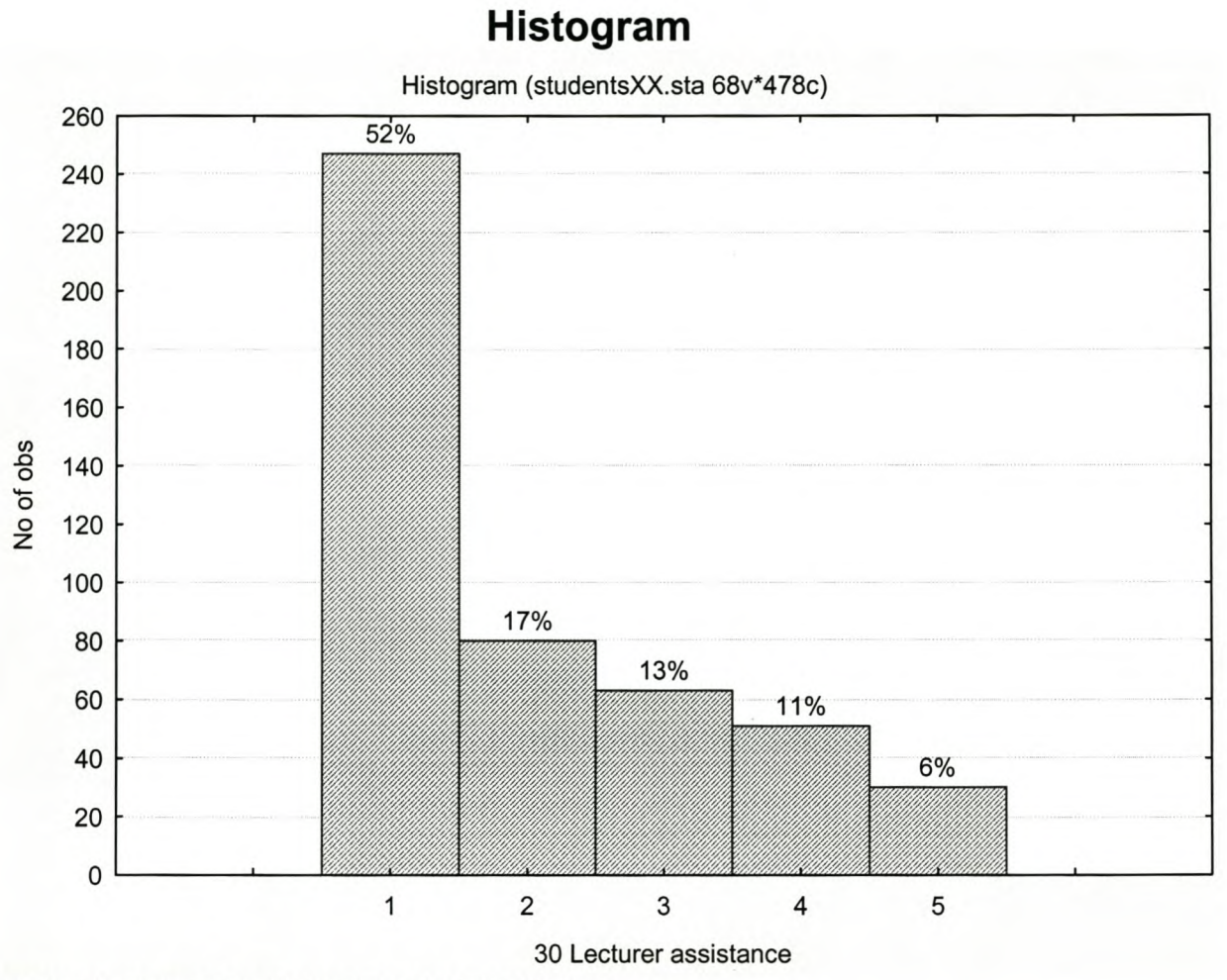
USING TECHNIKON LANGUAGE IN ASKING QUESTIONS



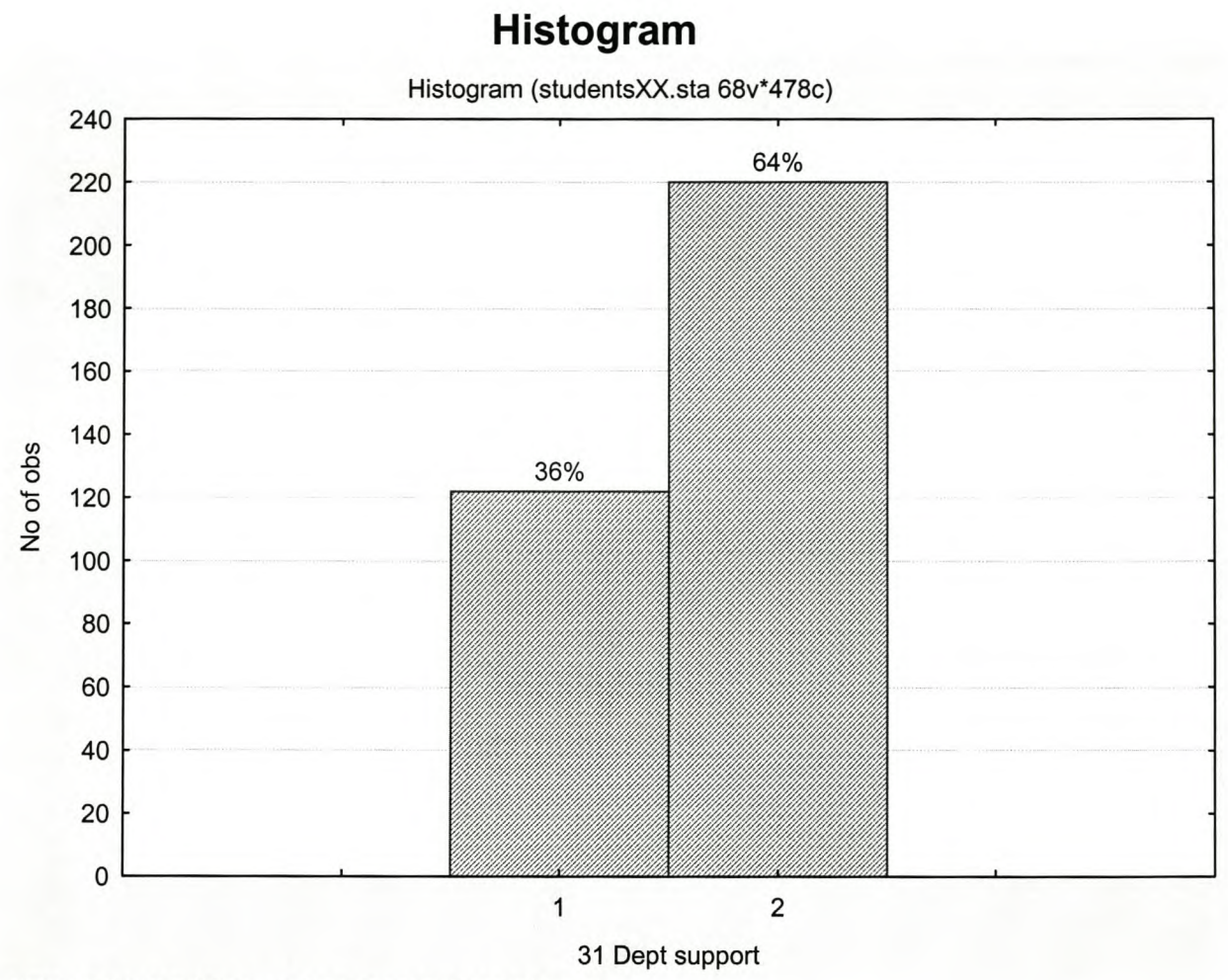
UNDERSTANDING TECHNIKON LANGUAGE



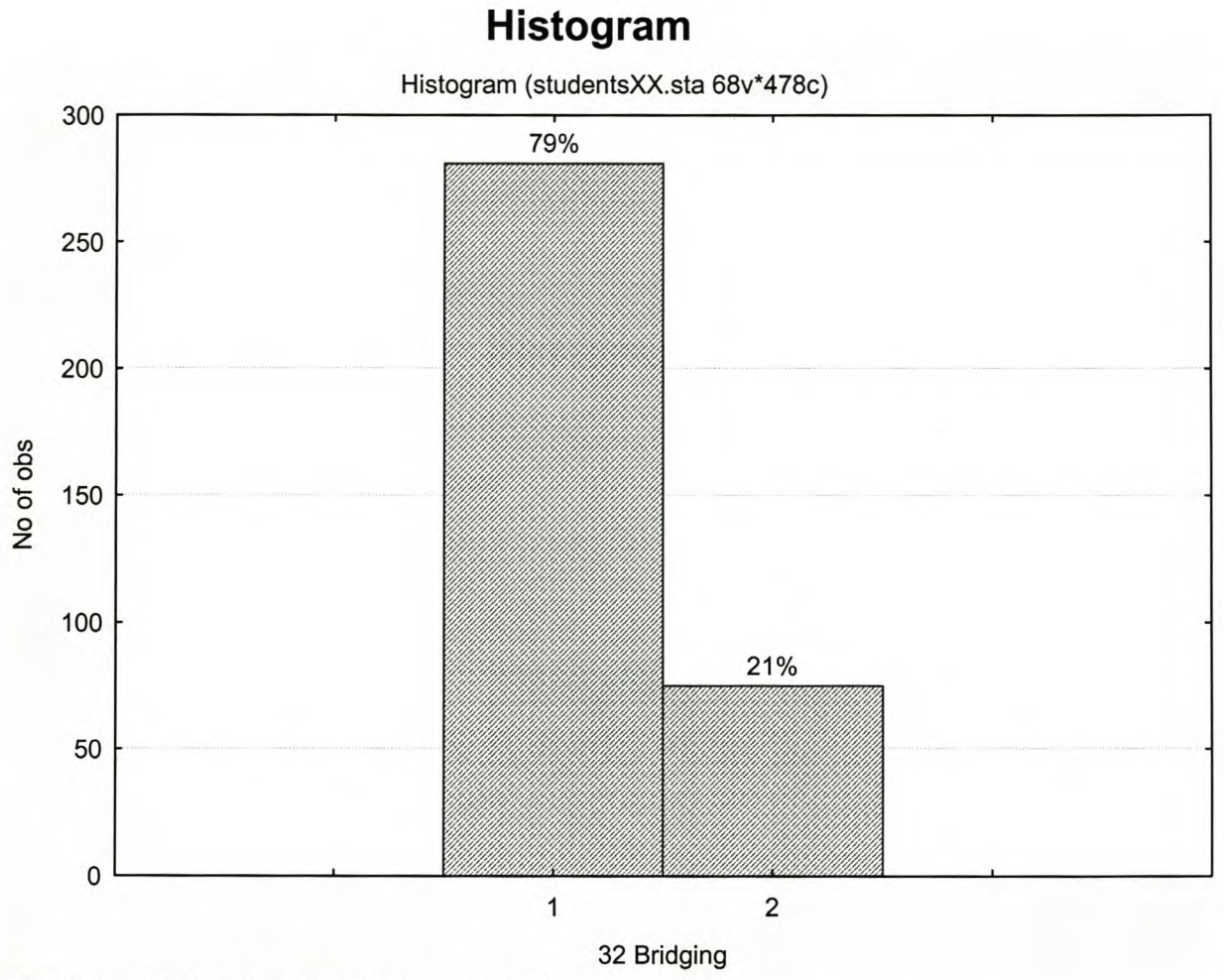
USING TECHNIKON LANGUAGE FOR PROBLEM SOLVING



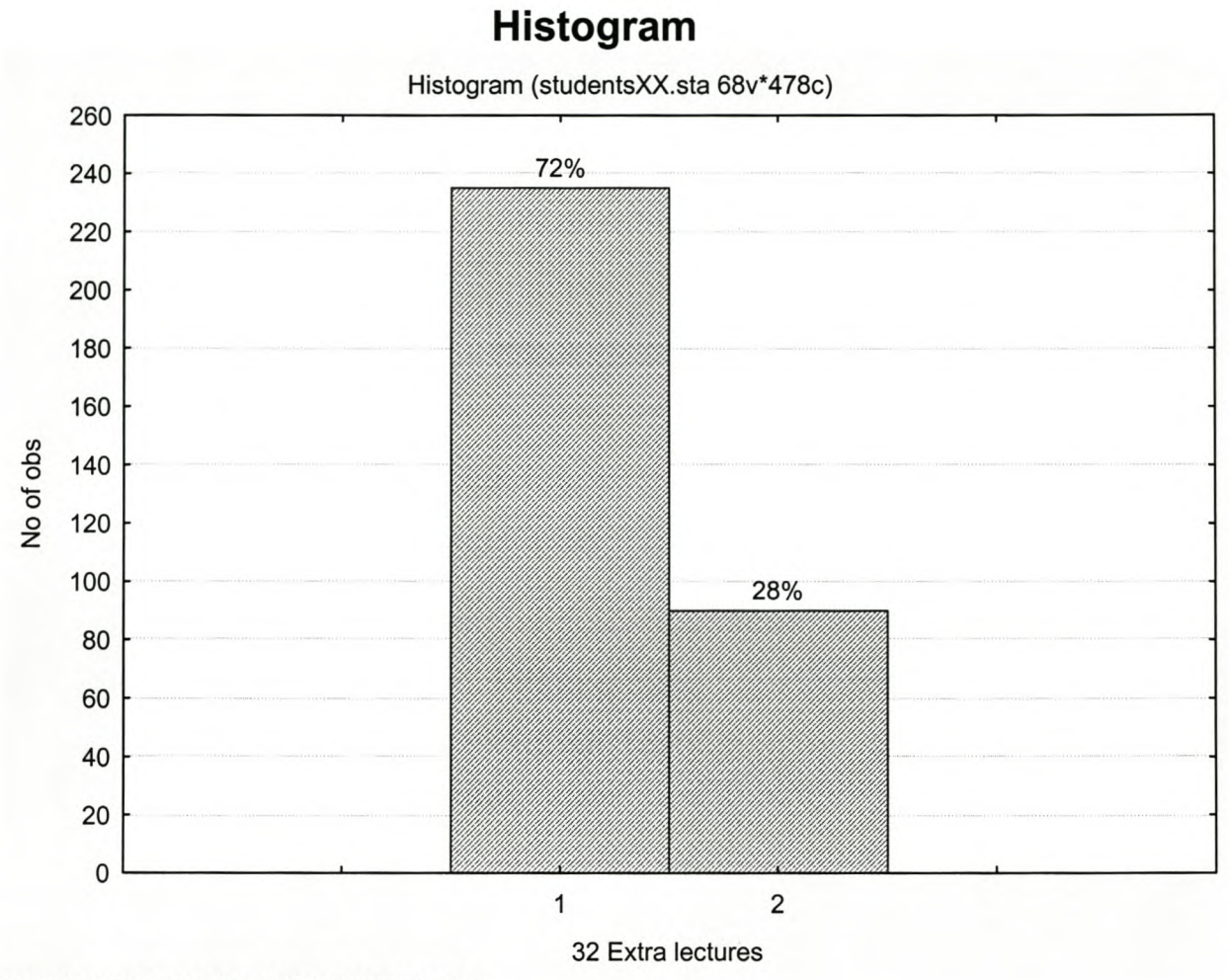
LECTURER ASSISTANCE OF LEARNERS



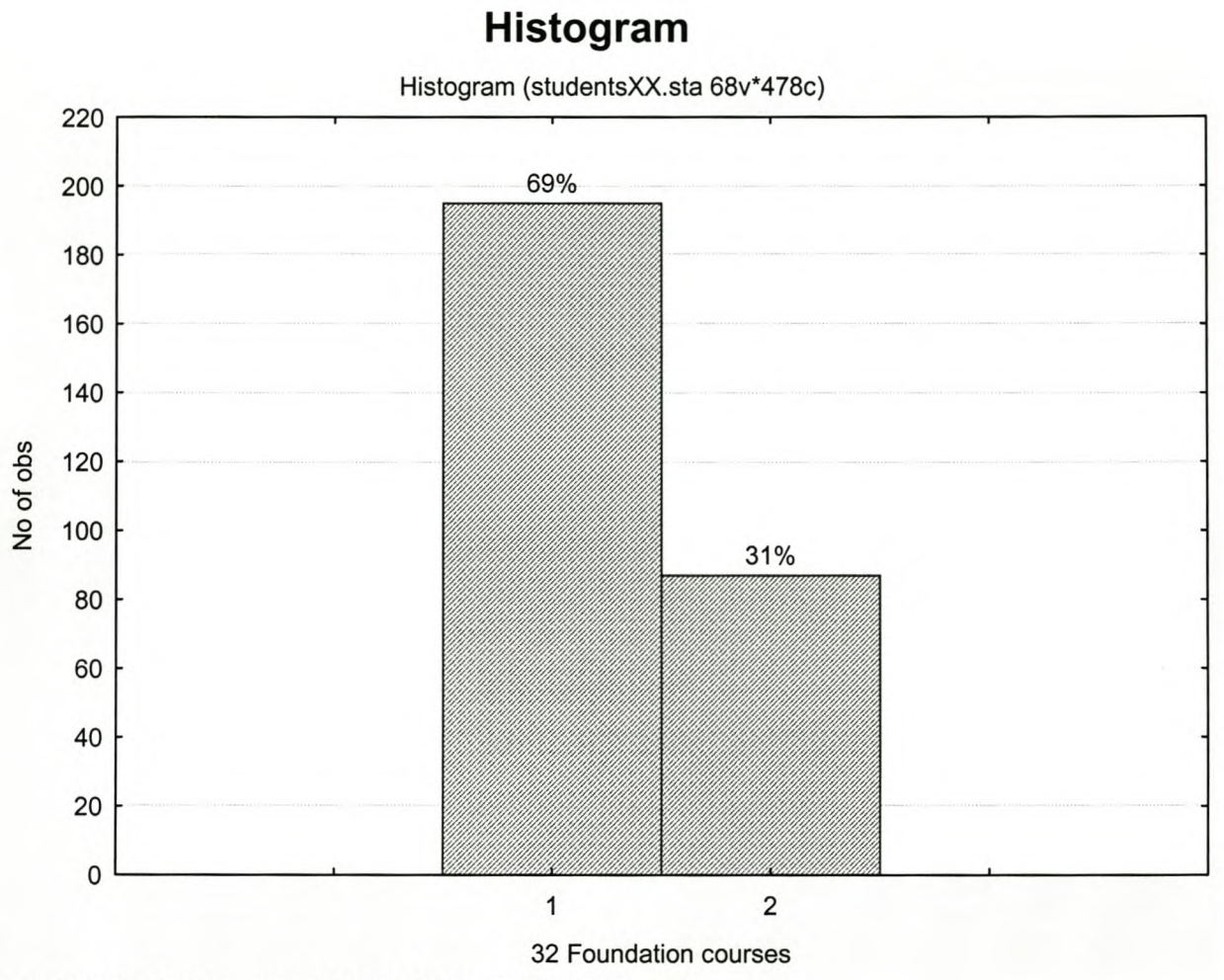
DEPARTMENTAL ACADEMIC SUPPORT



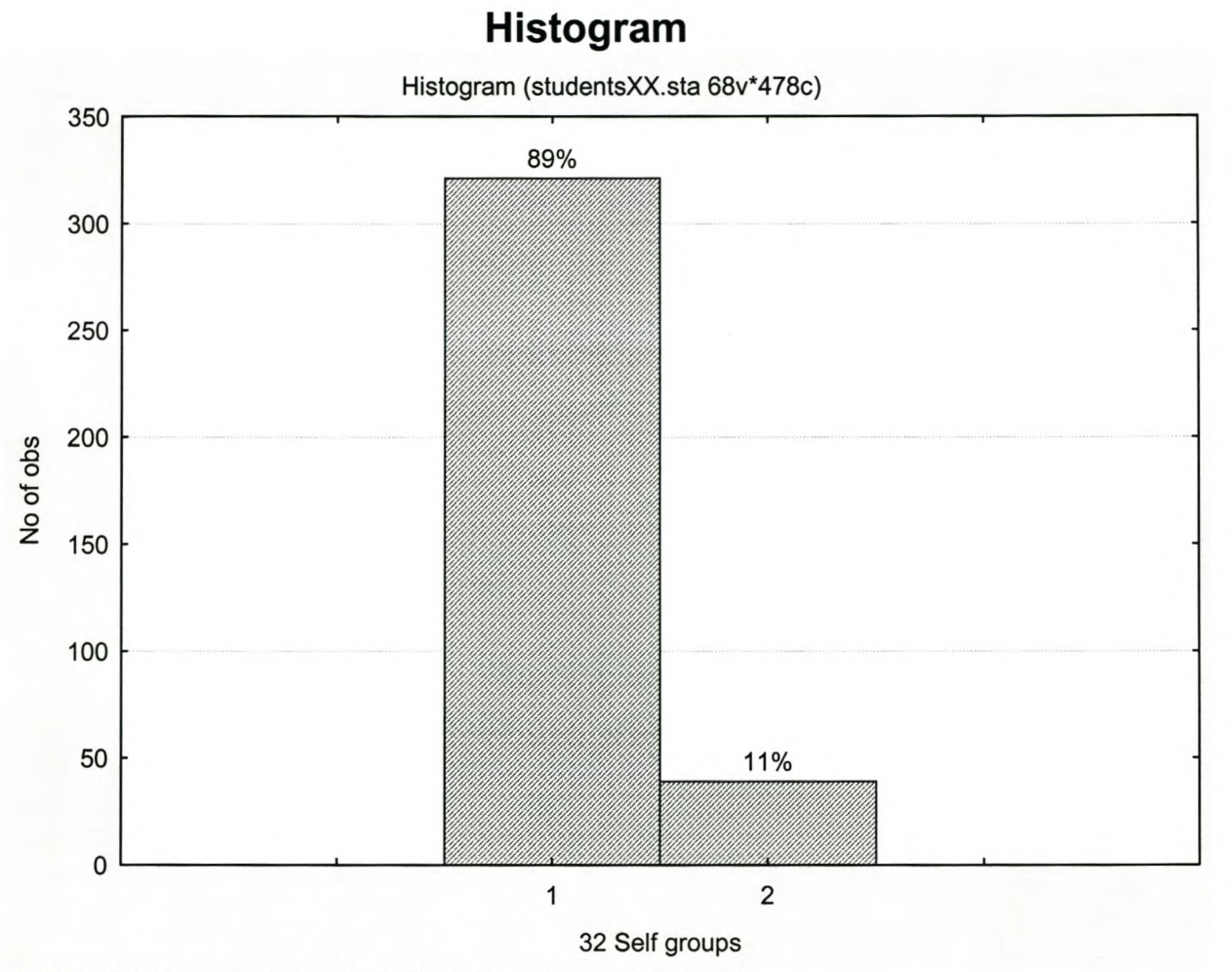
TECHNIKON BRIDGING PROGRAMMES



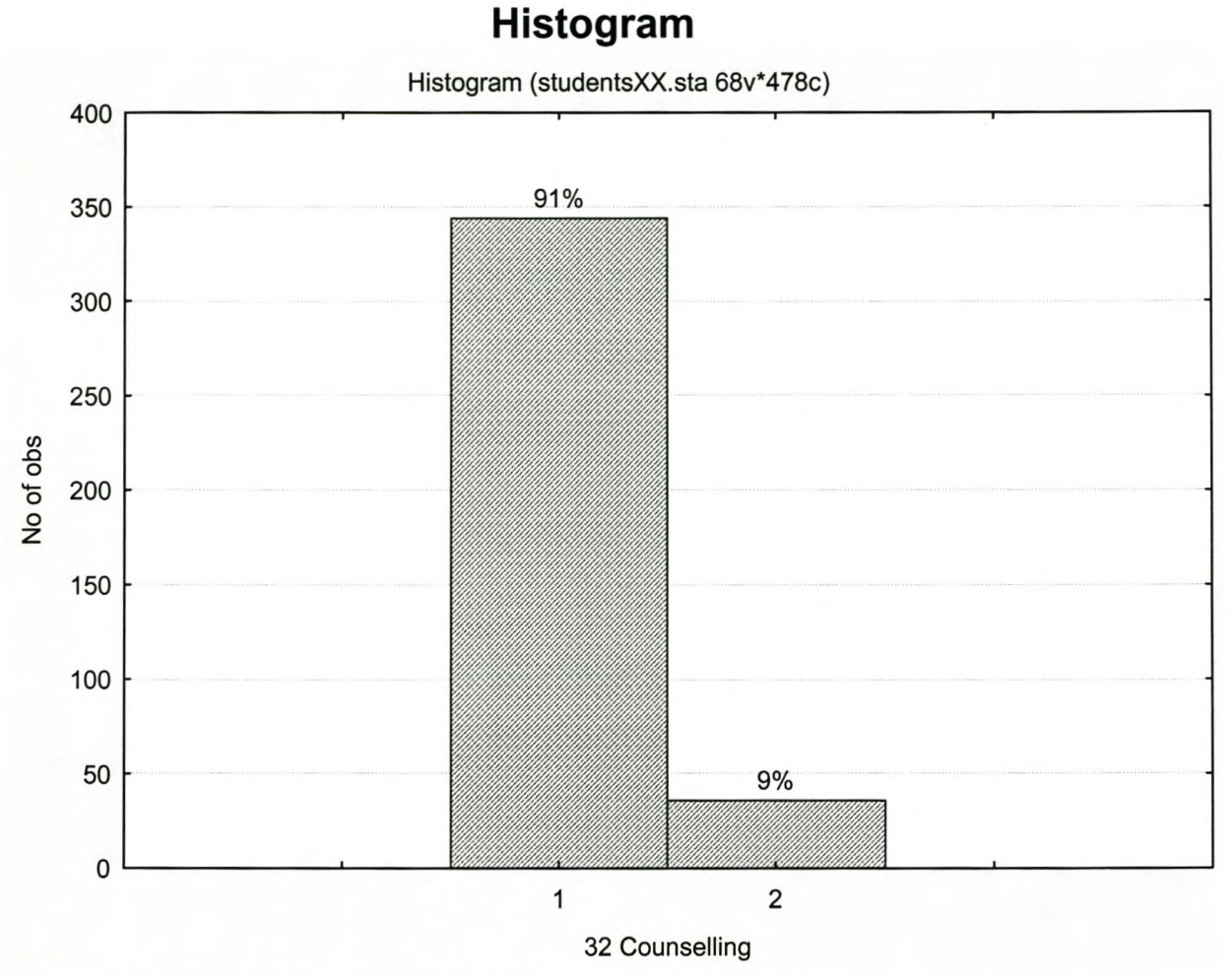
TECHNIKON EXTRA LECTURES



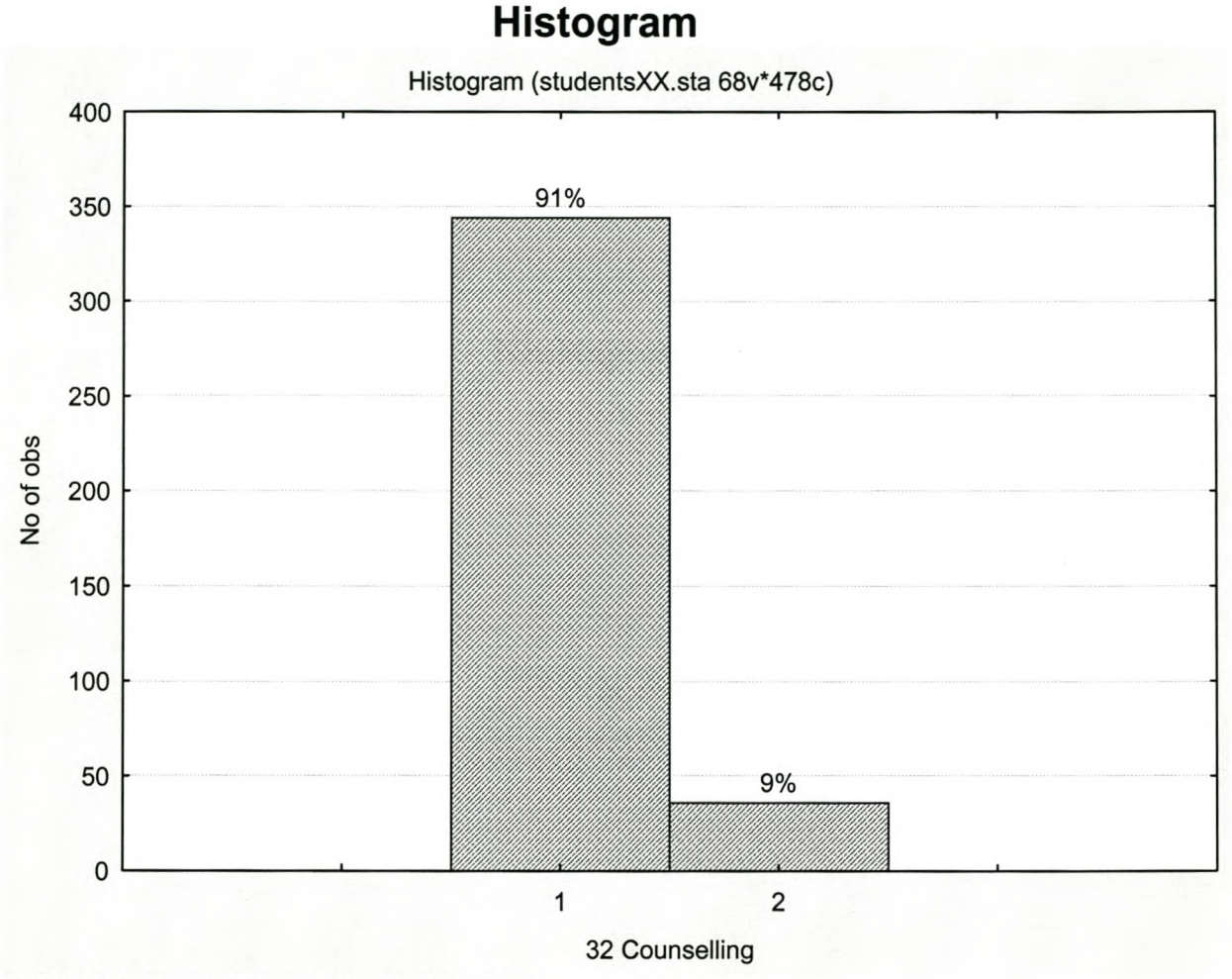
TECHNIKON FOUNDATION PROGRAMMES



TECHNIKON SELF CONSTITUTED STUDY GROUPS



STUDENT COUNSELLING SERVICE



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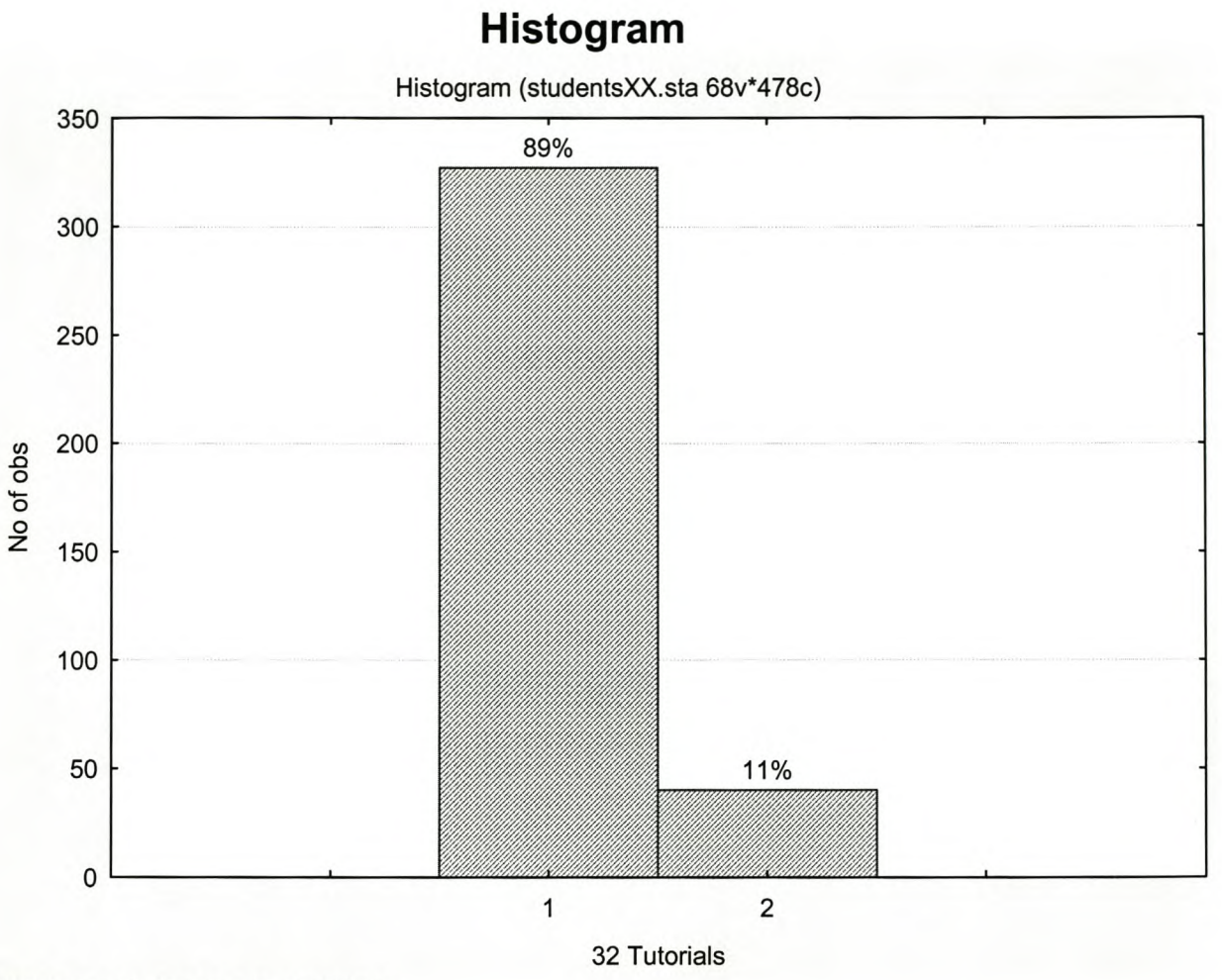
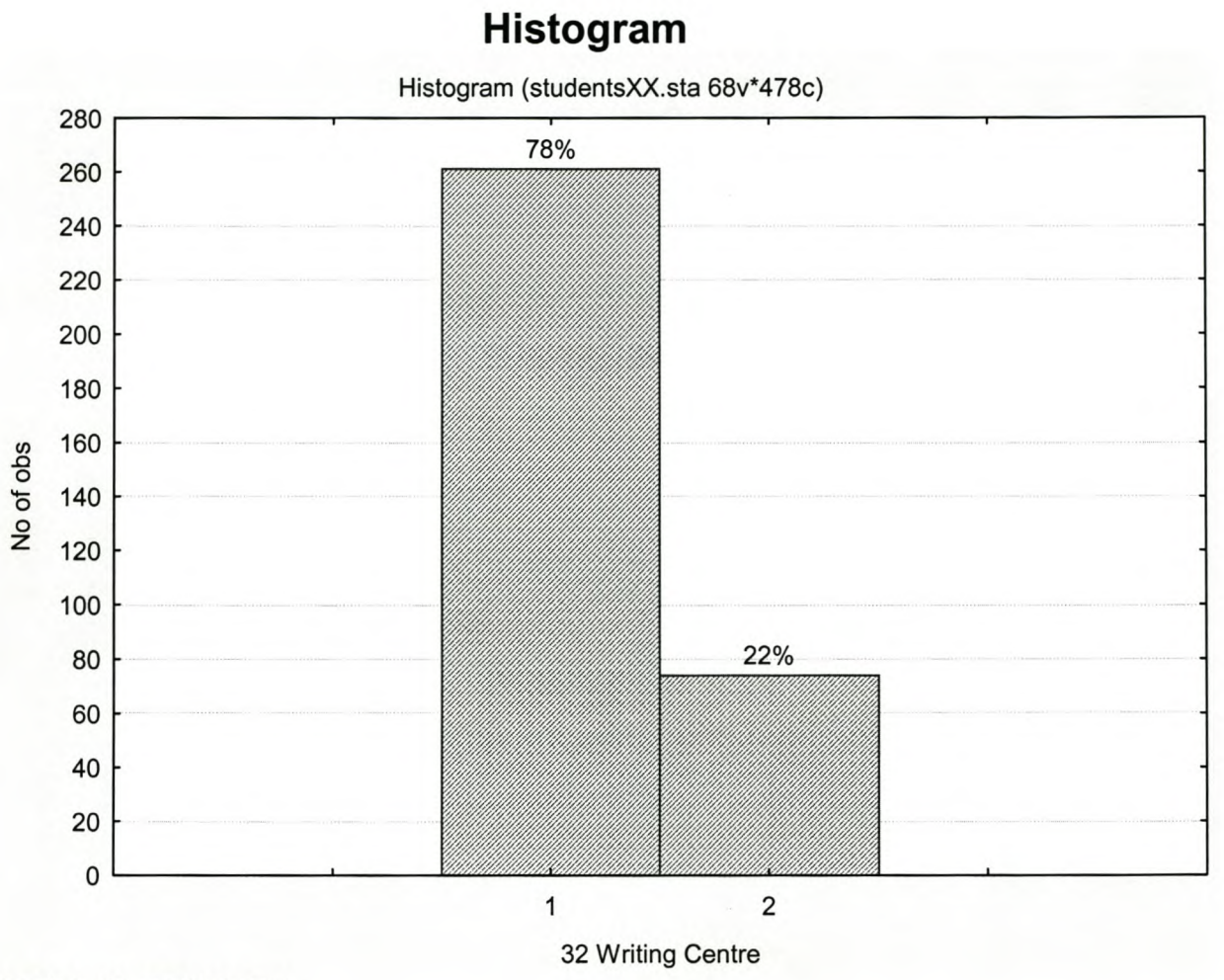
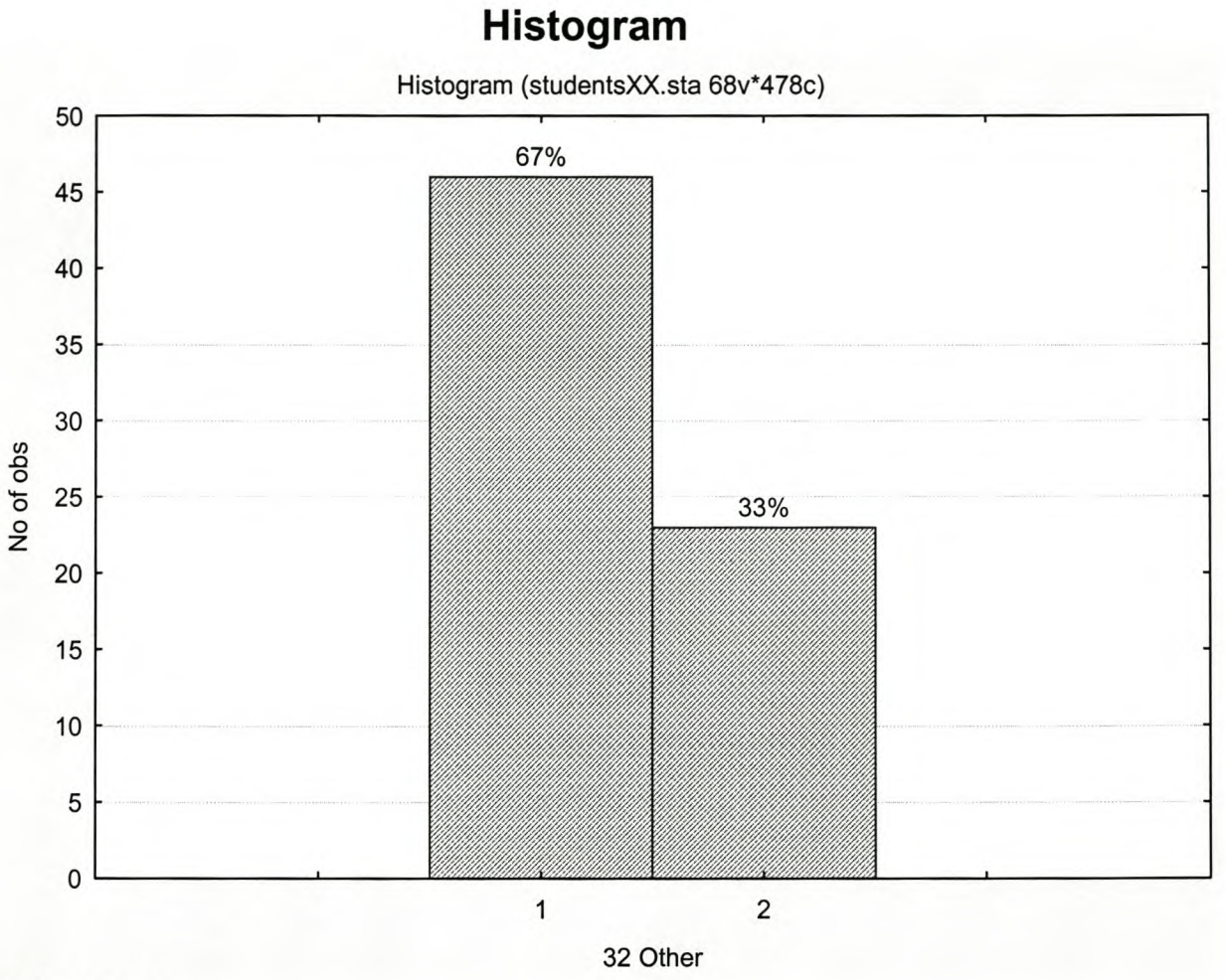


TUTORIAL PROGRAMMES



WRITING CENTRES



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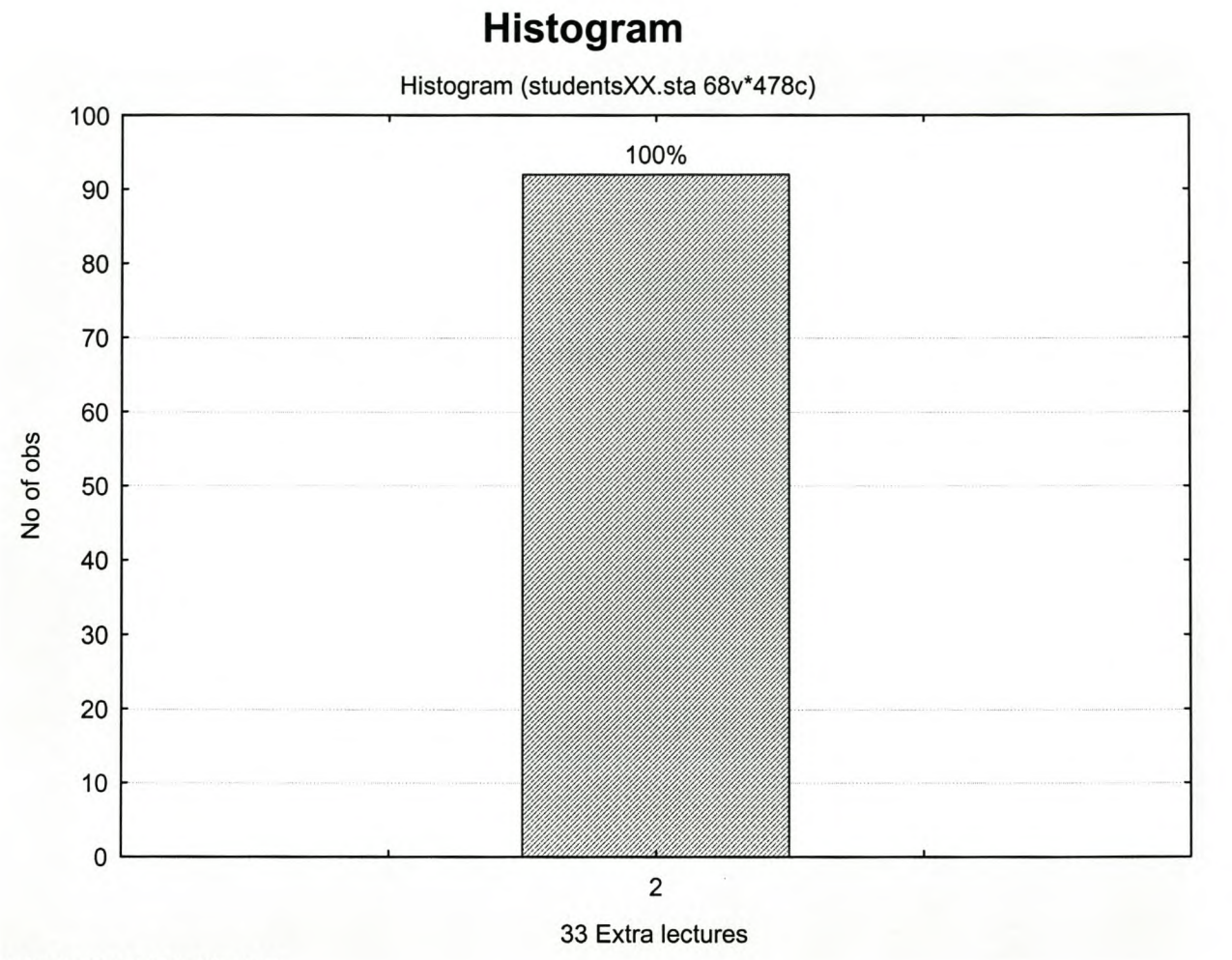
TECHNIKON BRIDGING



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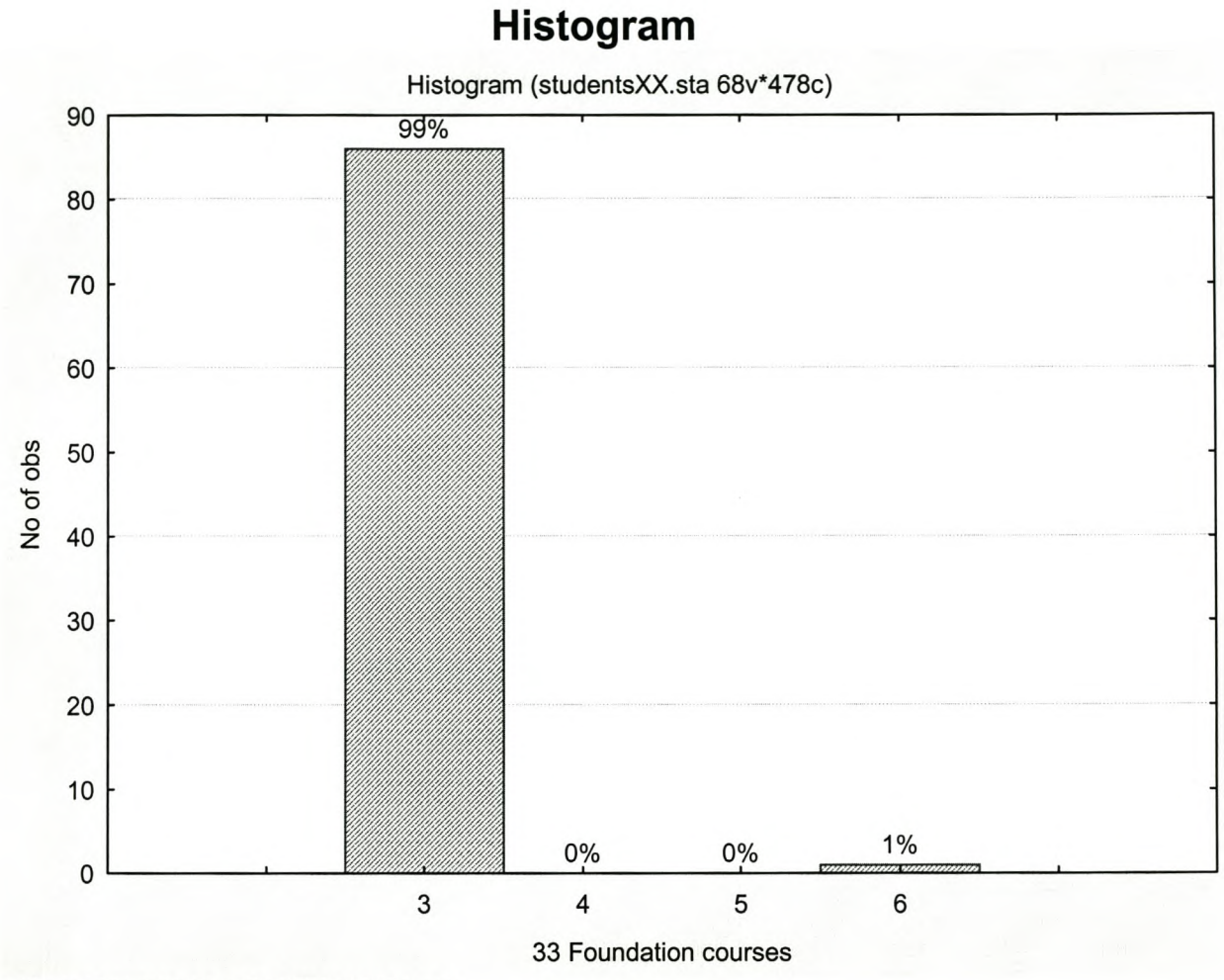
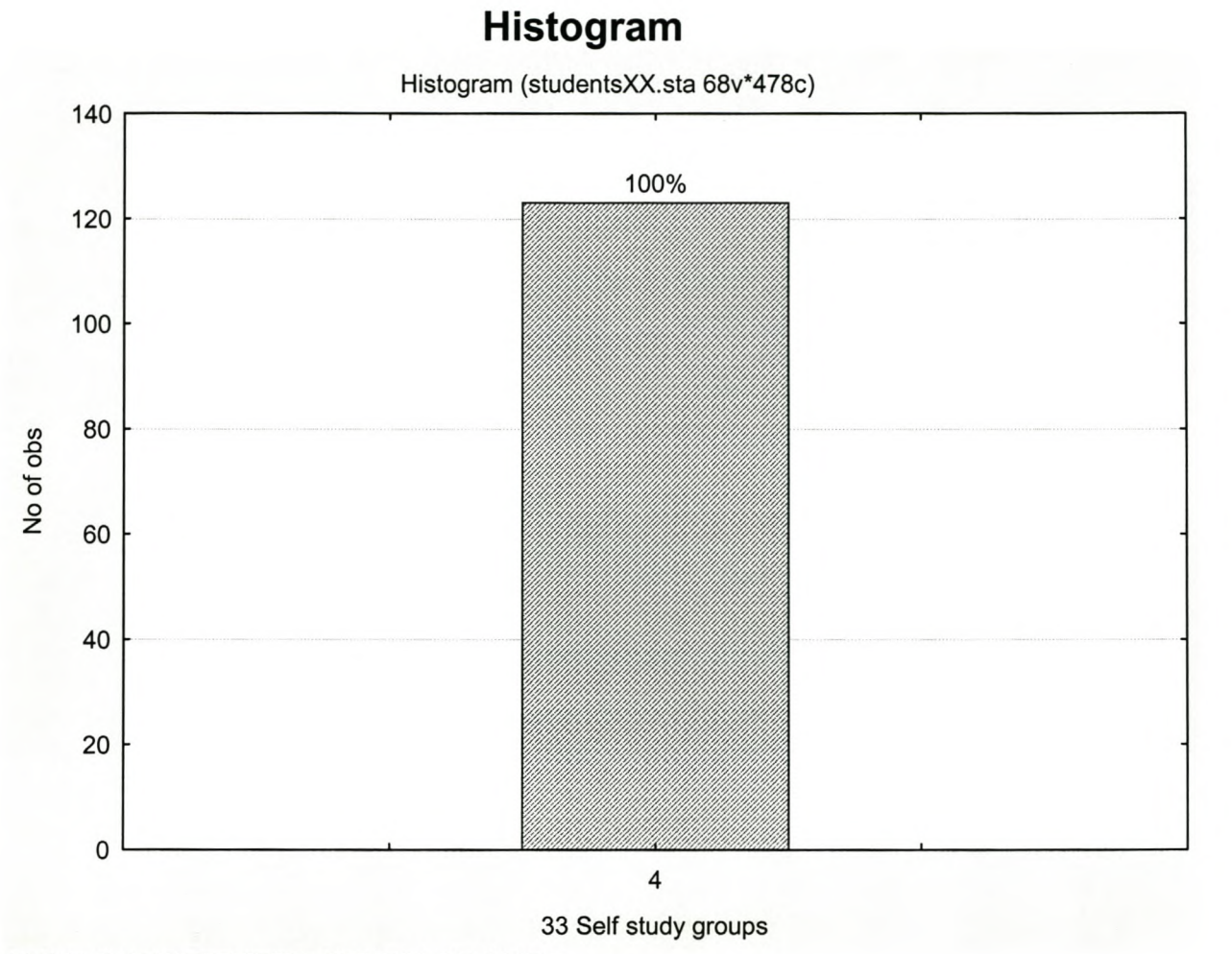
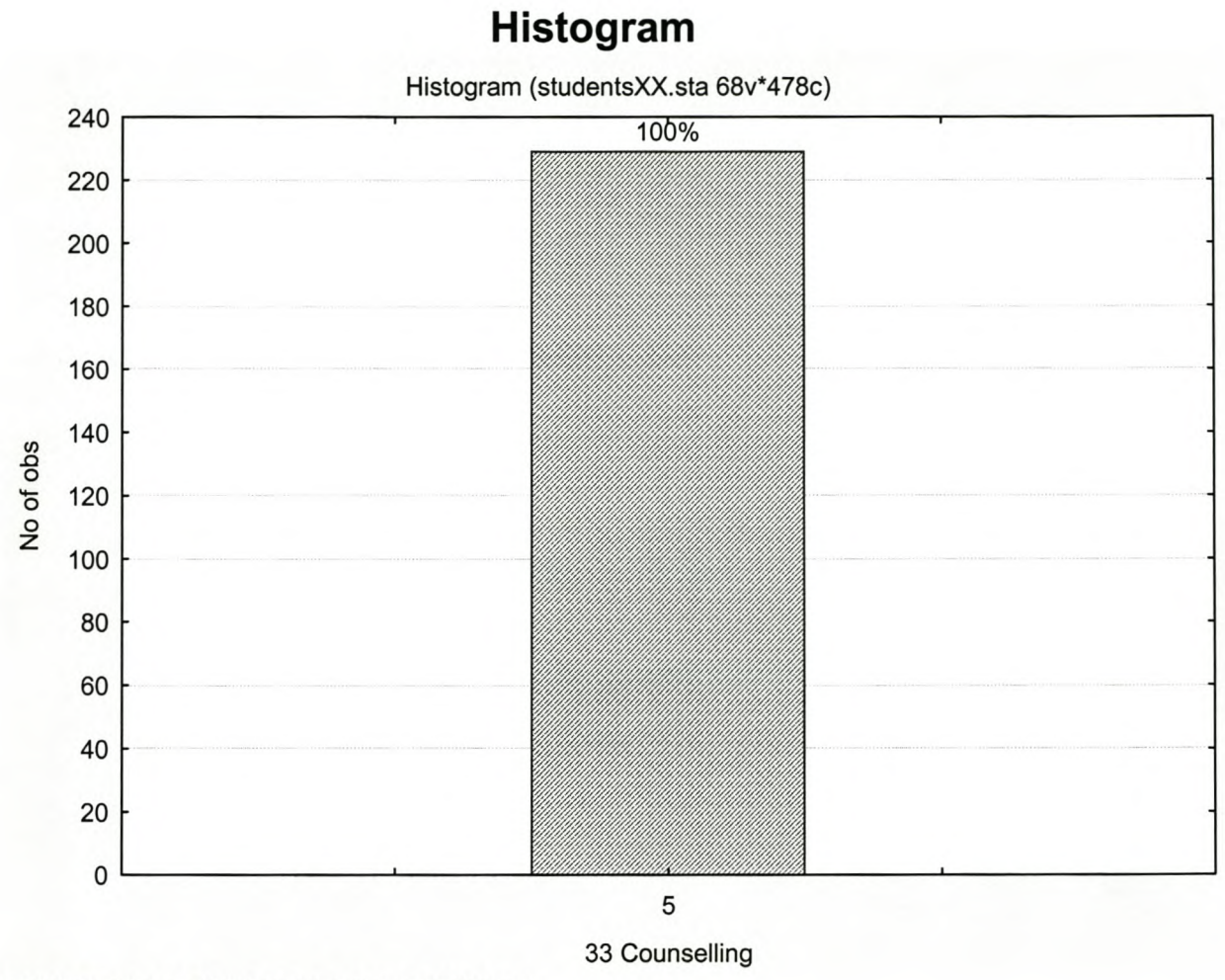


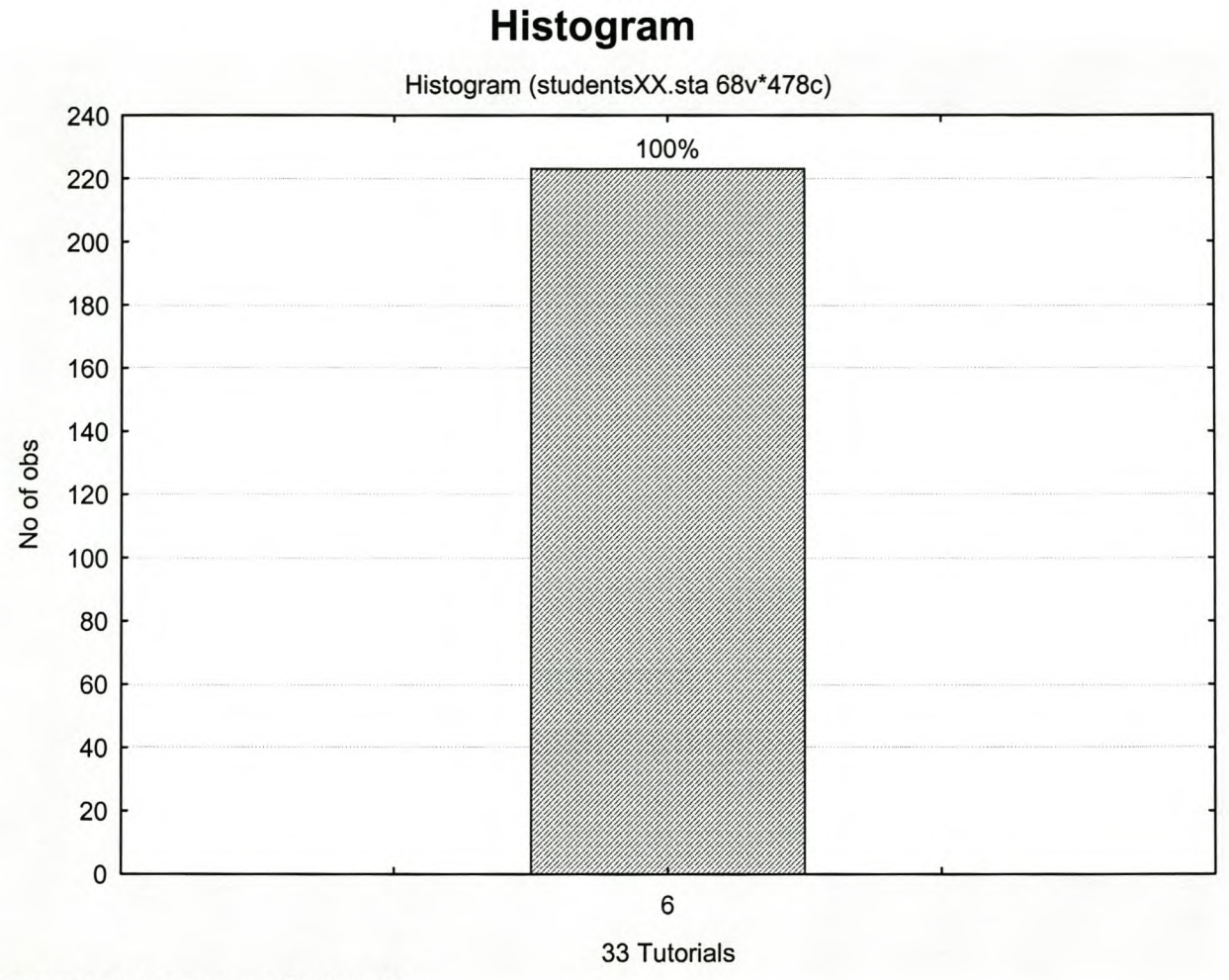
FOUNDATION PROGRAMMES



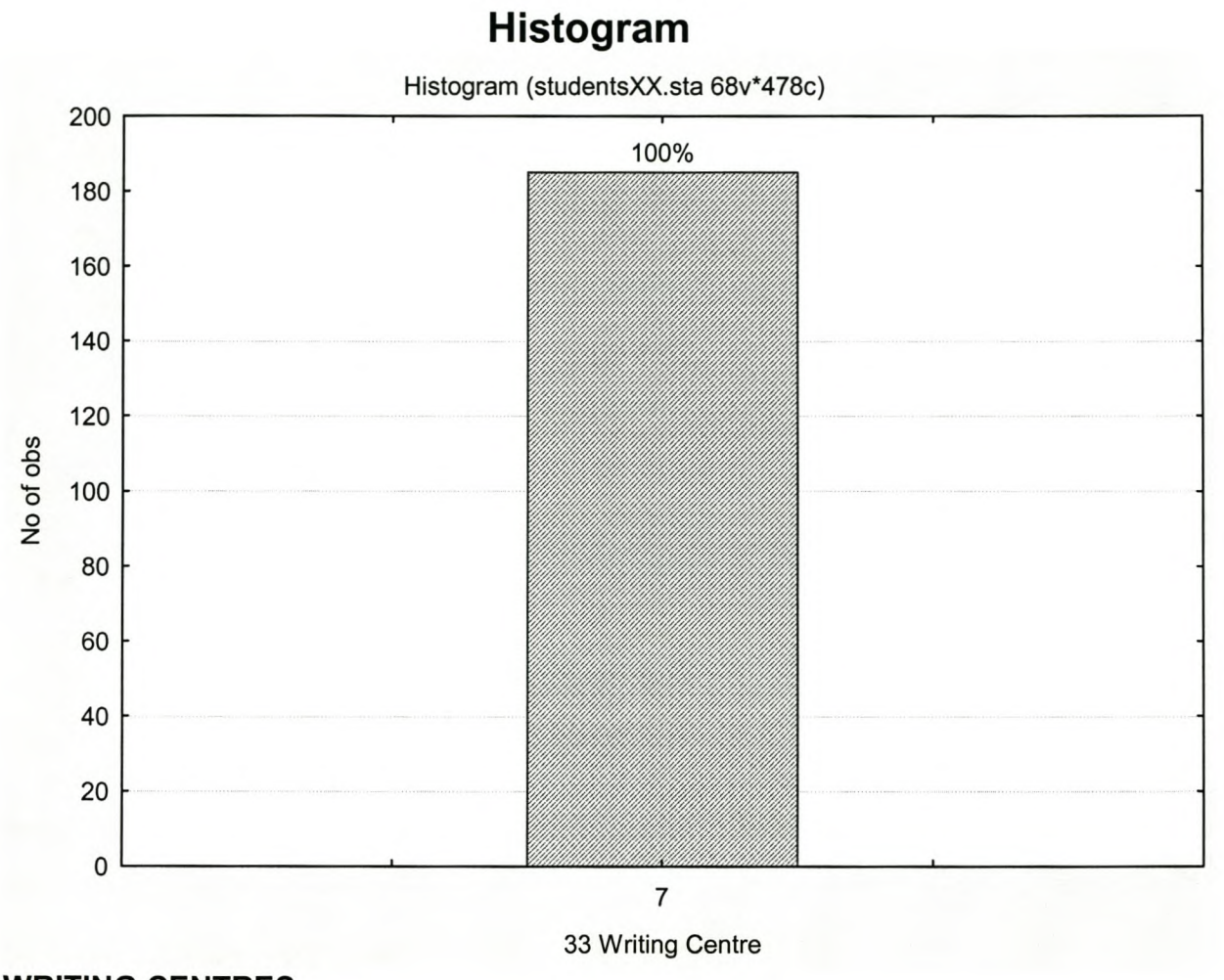
SELF-CONSTITUTED STUDY GROUPS



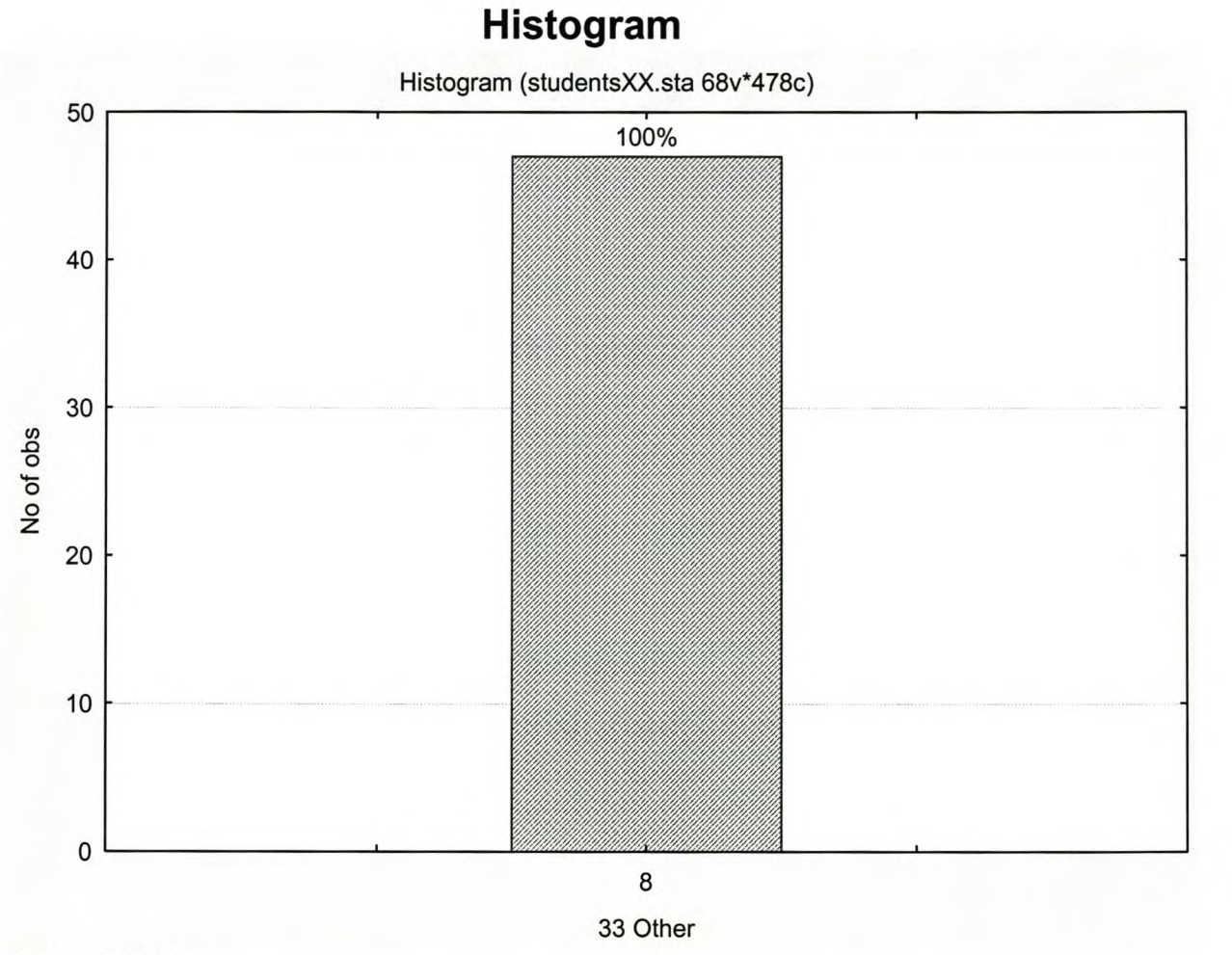
STUDENT COUNSELLING SERVICE



TUTORIAL PROGRAMMES



WRITING CENTRES



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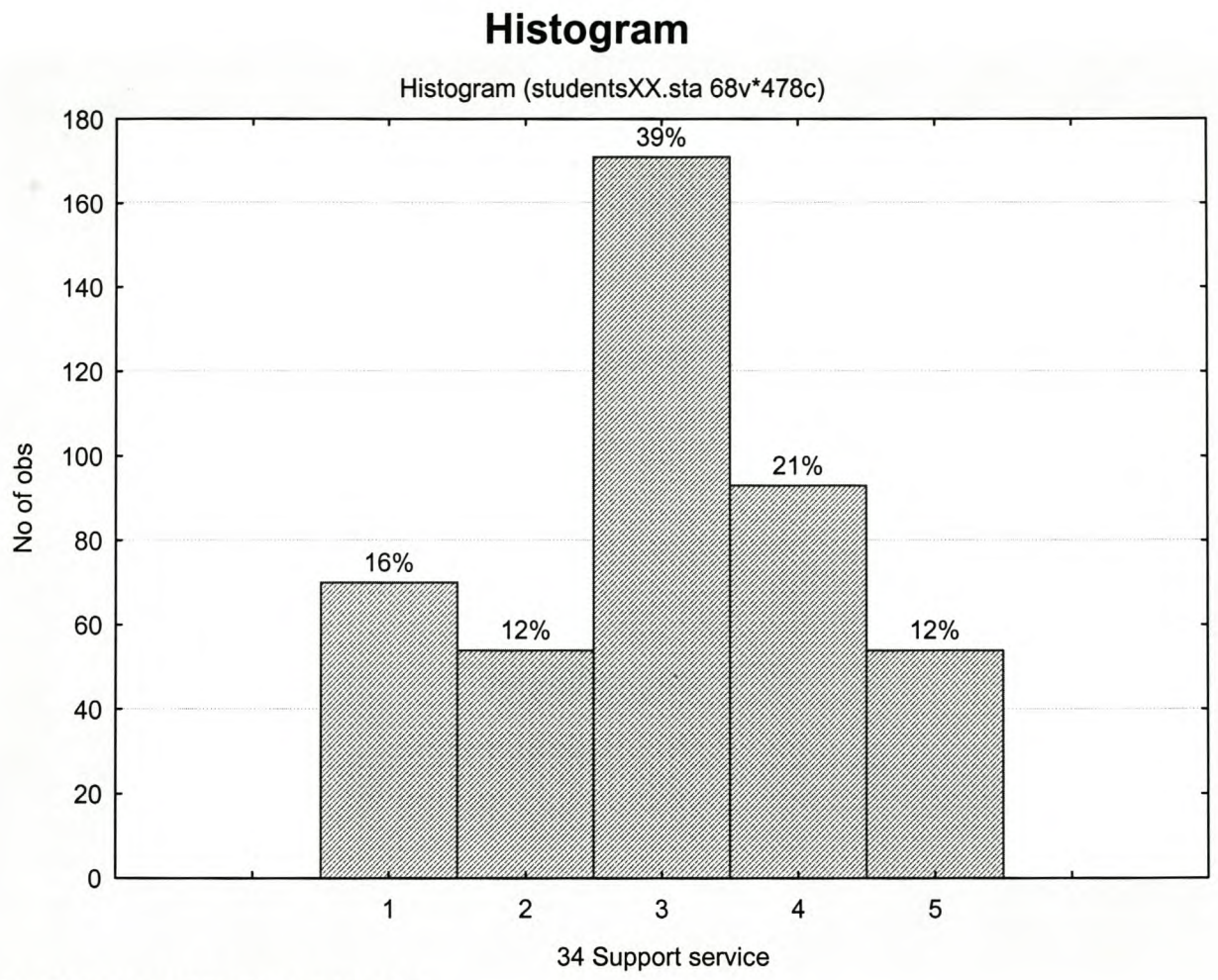
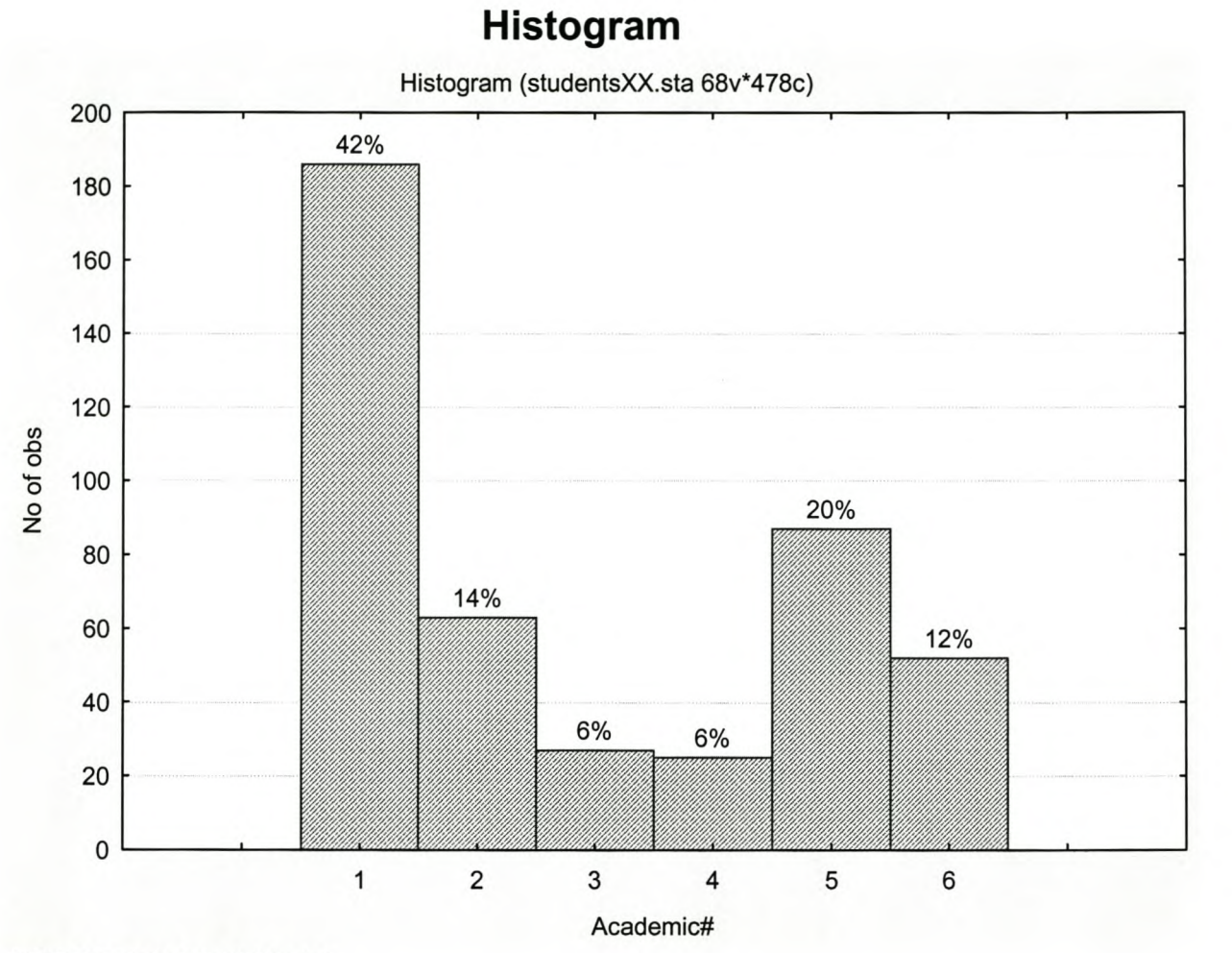
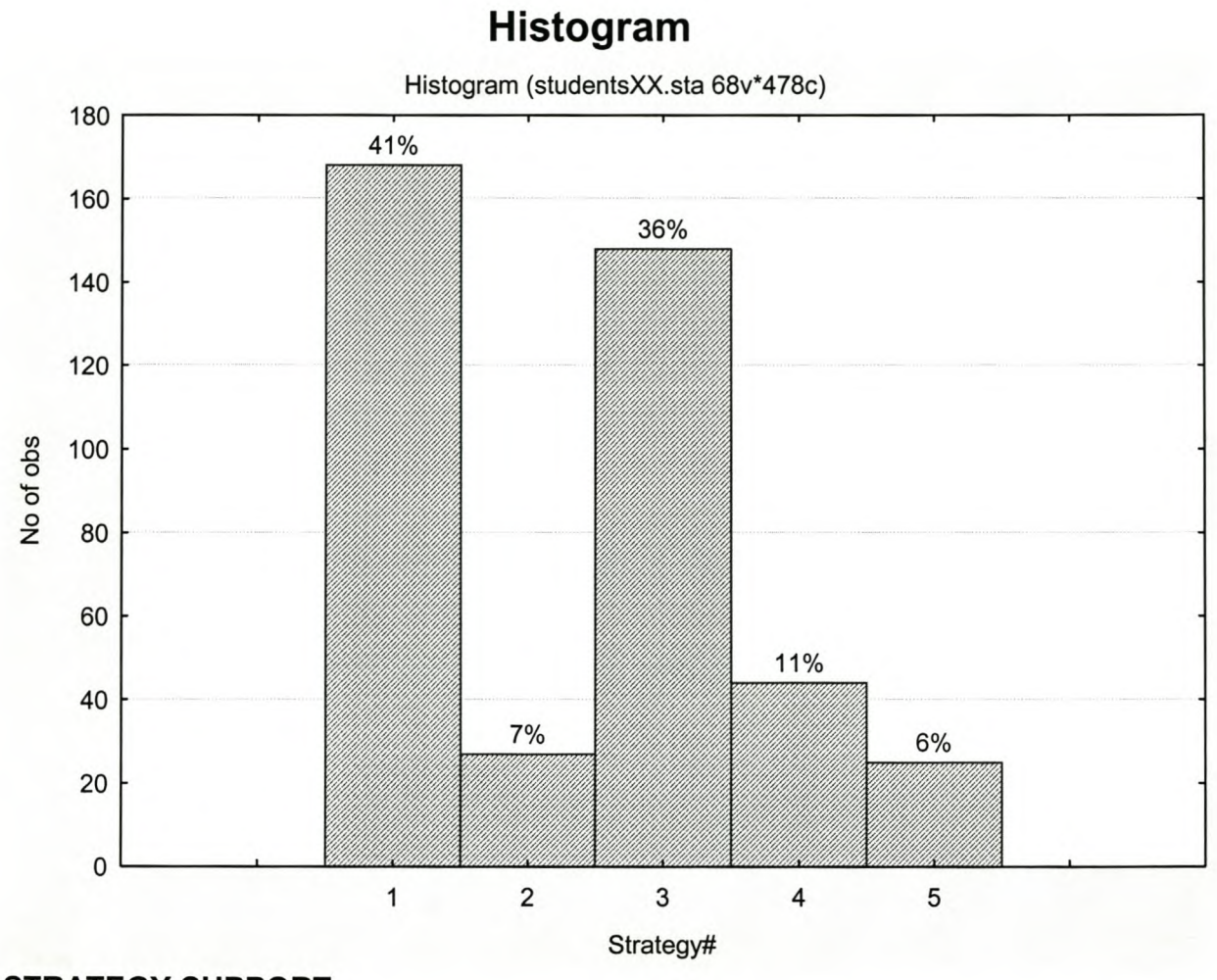


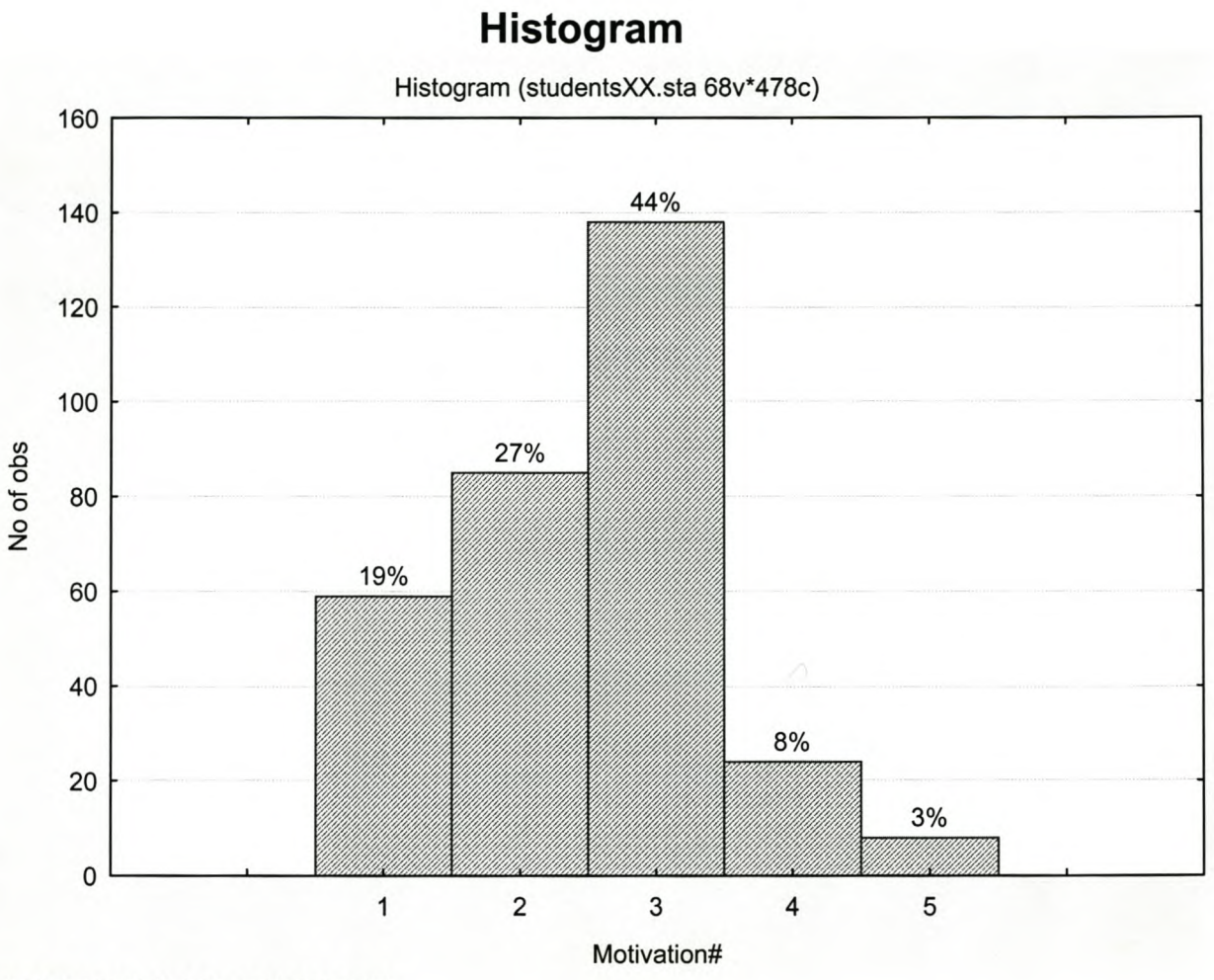
STUDENT SUPPORT SERVICE



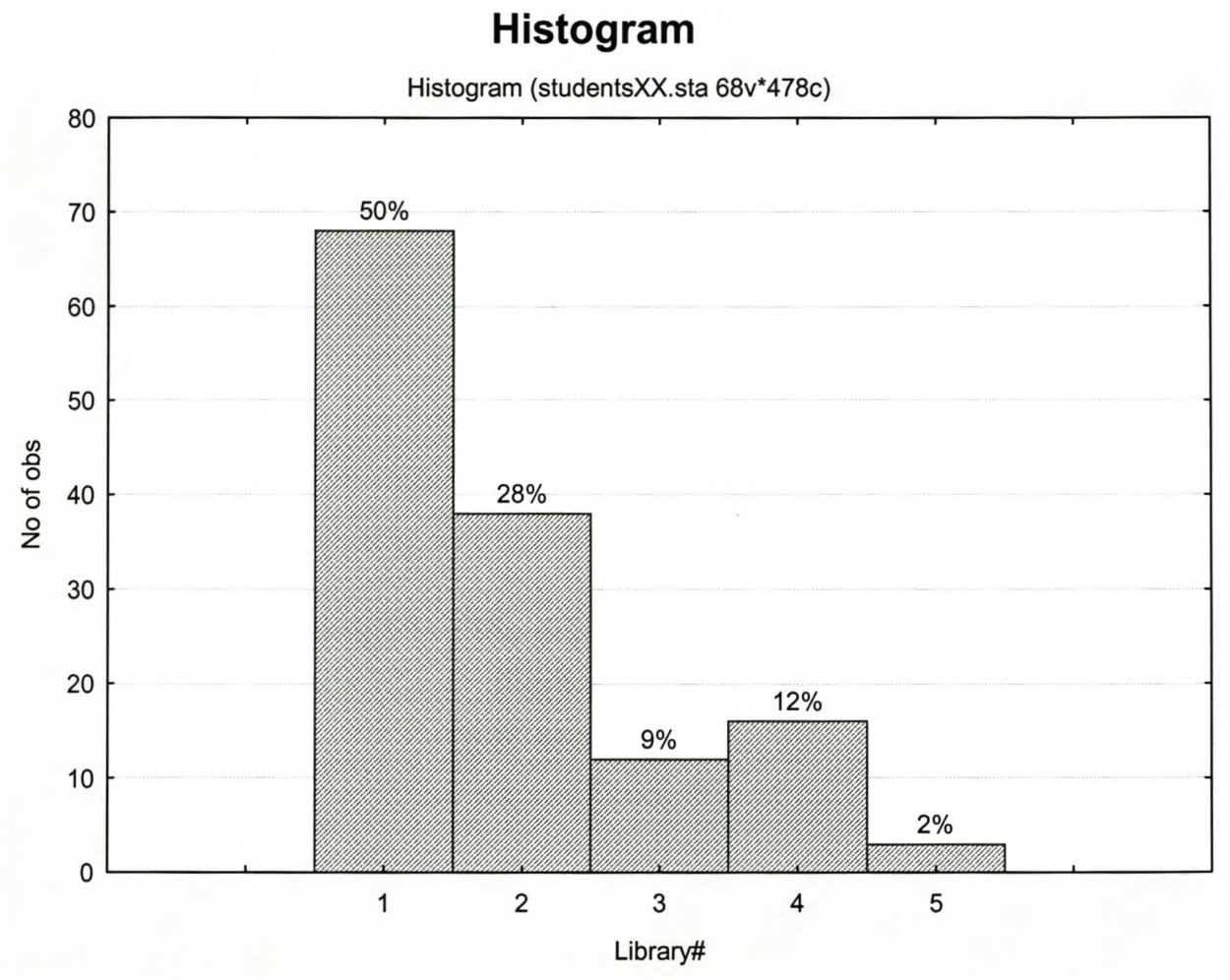
ACADEMIC SUPPORT



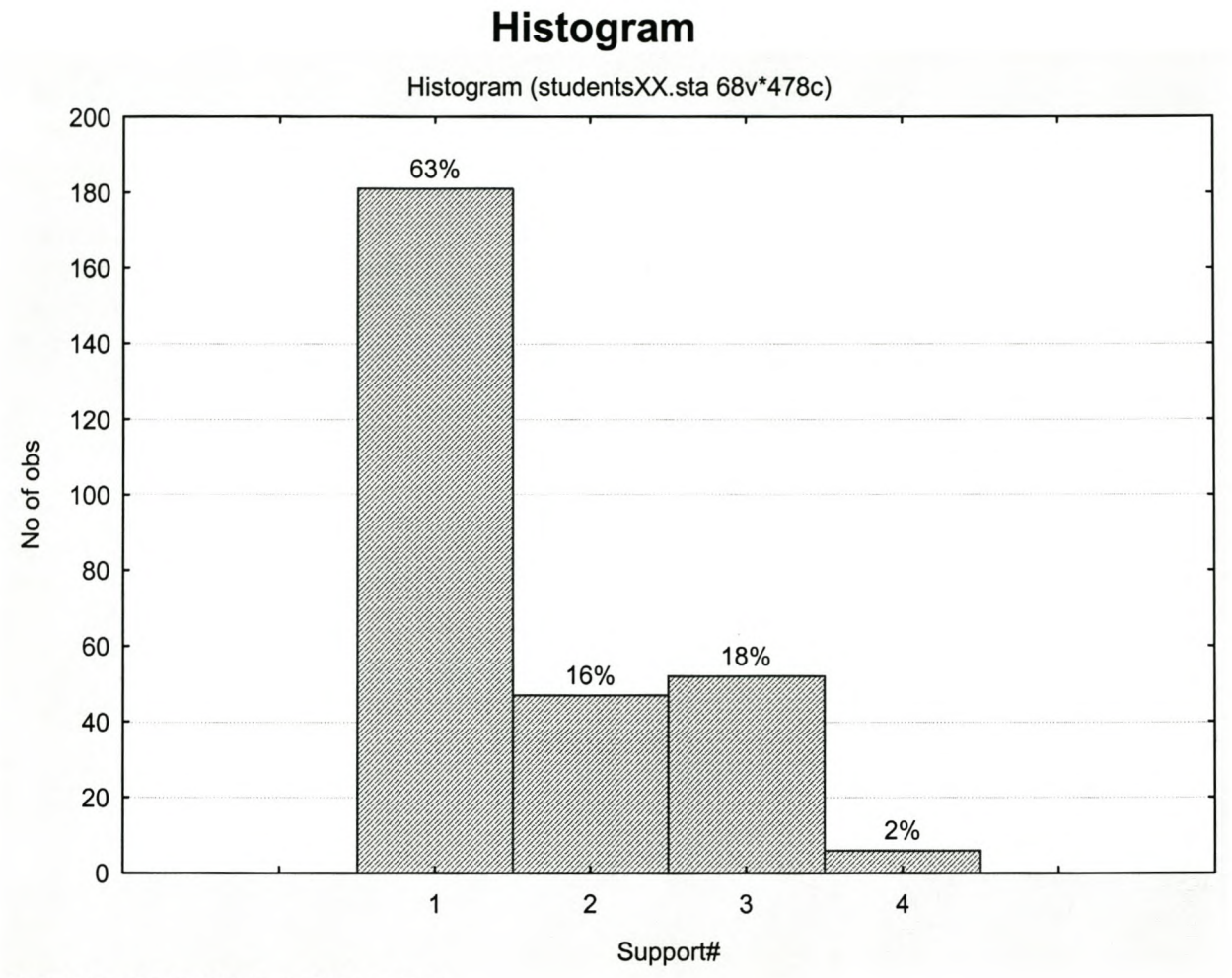
STRATEGY SUPPORT



MOTIVATIONAL SUPPORT



LIBRARY SUPPORT



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